

Data Validation Package

December 2004 Ground Water Sampling at the Monument Valley, Arizona, Processing Site

March 2005



**U.S. Department of Energy
Office of Legacy Management**

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Sampling Event Summary

Site: Monument Valley, Arizona, Processing Site

Sampling Period: December 7–8, 2004

Nineteen ground water samples were collected at the Monument Valley, Arizona, Processing Site to monitor ground water contaminants as specified in the *Final Site Observational Work Plan for the UMTRA Project Site at Monument Valley, Arizona*. Water levels were measured at each sampled well. Sampling and analysis was conducted as specified in *Sampling and Analysis Plan for GJO Projects, December 2002*. One duplicate sample was collected from location 0761. An equipment blank also was collected during this sampling event.

The data from this sampling event are consistent with values previously obtained and there is no indication of unexpected contaminant movement. Time concentration plots for ammonium, nitrate, sulfate, uranium, and vanadium are included with the results data. The increase in nitrate concentration in well 0762, as indicated on the time versus concentration graph, is consistent with downgradient movement of the contaminant plume. Increasing uranium concentrations in well 0662 have been noted and investigated. Analysis of soil samples collected near well 0662 indicate elevated uranium concentrations. Further investigation is planned. Wells with analyte concentrations that exceeded U.S. Environmental Protection Agency (EPA) ground water standards are listed in Table 1. Analyte concentrations in domestic well 0625 did not exceed any applicable standards.

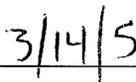
Table 1. Monument Valley Locations That Exceed Standards

Analyte	Standard ^a	Location	Concentration
Nitrate as N	10	0606	210
		0655	120
		0656	24
		0761	24
		0762	56
		0764	46
		0765	130
		0770	23
		0771	150
Uranium	0.044	0619	0.055
		0662	0.28
		0774	0.058

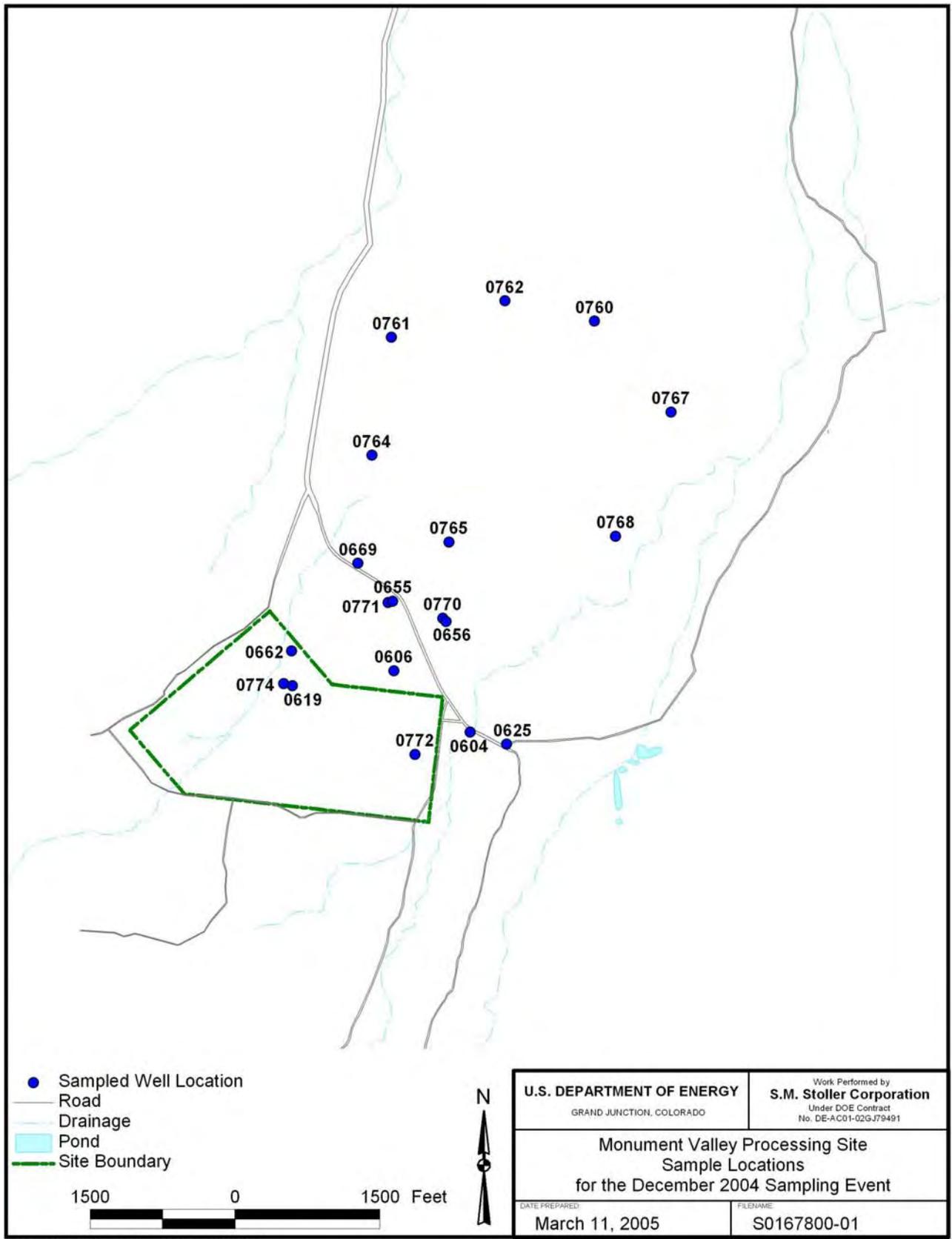
^aStandards are listed in 40 CFR 192.02 Table 1 to Subpart A; units are in mg/L.



David Miller
Site Lead, S.M. Stoller



Date



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Sample Locations at Monument Valley, Arizona, Processing Site

Data Assessment Summary

Water Sampling Field Activities Verification Checklist

Project	Monument Valley, Arizona	Date(s) of Water Sampling	December 7-8, 2004
Date(s) of Verification	February 18, 2005	Name of Verifier	Steve Donivan

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures? List other documents, SOP's, instructions.	Yes	Work order dated November 22, 2004.
2. Were the sampling locations specified in the planning documents sampled?	No	Private well 0625 was sampled instead of 0201.
3. Was a pre-trip calibration conducted as specified in the above named documents?	Yes	
4. Was an operational check of the field equipment conducted twice daily? Did the operational checks meet criteria?	Yes Yes	
5. Were the number and types (alkalinity, temperature, Ec, pH, turbidity, DO, ORP) of field measurements taken as specified?	Yes	
6. Was the Category of the well documented?	Yes	
7. Were the following conditions met when purging a Category I well: Was one pump/tubing volume purged prior to sampling? Did the water level stabilize prior to sampling? Did pH, specific conductance, and turbidity measurements stabilize prior to sampling? Was the flow rate less than 500 mL/min? If a portable pump was used, was there a 4 hour delay between pump installation and sampling?	Yes Yes Yes Yes NA	Turbidity in well 0760 did not stabilize.

Water Sampling Field Activities Verification Checklist (continued)

	Response (Yes, No, NA)	Comments
8. Were the following conditions met when purging a Category II well:		
Was the flow rate less than 500 mL/min?	Yes	
Was one pump/tubing volume removed prior to sampling?	Yes	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	Yes	
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were QC samples assigned a fictitious site identification number?	Yes	
Was the true identity of the samples recorded on the Quality Assurance Sample Log?	Yes	
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	Yes	
15. Were the number and types of samples collected as specified?	Yes	
16. Were chain of custody records completed and was sample custody maintained?	Yes	
17. Are field data sheets signed and dated by both team members?	No	One signature per page.
18. Was all other pertinent information documented on the field data sheets?	Yes	
19. Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
20. Were water levels measured at the locations specified in the planning documents?	Yes	

Laboratory Performance Assessment

General Information

Report Number (RIN): 04110138
Sample Event: December 7–8, 2004
Site(s): Monument Valley, Arizona
Laboratory: Paragon Analytics
Work Order No.: 0412101
Analysis: Metals, Inorganics
Validator: Steve Donivan
Review Date: February 17, 2005

This validation was performed according to *Standard Practice for Validation of Laboratory Data*, GT-9(P) (2004). All analyses were successfully completed. The samples were prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 2

Table 2. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Ammonia as N, NH ₃ -N	WCH-A-005	MCAWW 350.1	MCAWW 350.1
Calcium, Potassium, Magnesium, Sodium	MET-A-020	SW-846 3005A	SW-846 6010B
Nitrate+Nitrite as N, NO ₃ +NO ₂ -N	WCH-A-005	MCAWW 353.2	MCAWW 353.2
Sulfate, SO ₄	MIS-A-044	SW-856 9056	SW-856 9056
Uranium, U	GJO-01	SW-846 3005A	SW-846 6020
Vanadium, V	GJO-18	SW-846 3005A	SW-846 6020

Sample Shipping/Receiving

Paragon Analytics in Fort Collins, Colorado, received 21 water samples on December 10, 2004, accompanied by a Chain of Custody (COC) form. The COC form was checked to confirm that all of the samples were listed on the form and that signatures and dates were present indicating sample relinquishment and receipt. The sample submittal documents including the Chain of Custody Form, the Sample Submittal Form, and the sample tickets had no errors or omissions.

Preservation and Holding Times

The sample shipment was received cool and intact with temperature within the coolers of 0.4 and 0.8 degrees centigrade (°C), which complies with requirements. All samples had been preserved correctly for the requested analyses and all samples were analyzed within the applicable holding times.

Data Qualifier Summary

Sample results were qualified with a “J” flag (estimated quantity) or a “U” flag (not detected) as shown in Table 3.

Table 3. Data Qualifier Summary

Sample Number	Location	Analyte	Flag	Reason
0412101-1	0655	V	J	Interference check failure
0412101-2	0771	V	J	Interference check failure
0412101-3	0770	V	J	Interference check failure
0412101-4	0656	V	J	Interference check failure
0412101-5	0764	V	J	Interference check failure
0412101-6	0669	V	J	Interference check failure
0412101-7	0765	V	J	Interference check failure
0412101-8	0760	V	J	Interference check failure
0412101-9	0606	V	J	Interference check failure
0412101-10	0662	V	J	Interference check failure
0412101-11	0774	V	J	Interference check failure
0412101-12	0619	V	J	Interference check failure
0412101-13	0772	V	J	Interference check failure
0412101-14	0604	V	J	Interference check failure
0412101-15	0761	V	J	Interference check failure
0412101-16	2709	V	J	Interference check failure
0412101-17	0762	V	J	Interference check failure
0412101-18	2710	Ca	U	Less than 5 times calibration blank
0412101-18	2710	Mg	U	Less than 5 times calibration blank
0412101-18	2710	K	U	Less than 5 times calibration blank
0412101-18	2710	Na	U	Less than 5 times calibration blank
0412101-18	2710	U	U	Less than 5 times calibration blank
0412101-20	0625	U	U	Less than 5 times calibration blank
0412101-21	0768	U	U	Less than 5 times calibration blank

Laboratory Instrument Calibration

All laboratory instrument calibrations were performed correctly in accordance with the cited methods.

The initial calibration for ammonia as N was performed using six calibration standards on December 30, 2004, resulting in a correlation coefficient (r^2) value greater than 0.995. Initial and continuing calibration checks (CCVs) were made at the required frequency resulting in four CCVs. All initial and continuing calibration verifications were within the acceptance criteria.

Calibrations for calcium, magnesium, potassium, and sodium were performed on December 15, 2004, and December 28, 2004. The initial calibrations were performed using three calibration standards resulting in r^2 values greater than 0.995. The absolute value of the intercepts was less than 3 times the method detection limit (MDL). Calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration

verification checks were made at the required frequency resulting in 23 CCVs. All calibration checks met the acceptance criteria. A reporting limit verification check was made at the required frequency to verify the linearity of the calibration curve near the practical quantitation limit. The interference check results were within the acceptance criteria.

The initial calibration for nitrate+nitrite as N was performed using seven calibration standards on December 30, 2004, resulting in an r^2 value greater than 0.995. Initial and continuing calibration checks were made at the required frequency resulting in three CCVs. All initial and continuing calibration verifications were within the acceptance criteria.

Initial calibration was performed for sulfate using five calibration standards on December 14, 2004. The calibration curve r^2 value was greater than 0.995 with an intercept less than 3 times the MDL. Initial calibration and calibration check standards were prepared from independent sources. Continuing calibration checks were made at the correct frequency resulting in 10 CCVs and all initial and continuing calibration verifications were within the acceptance criteria.

Calibrations for uranium and vanadium were performed on December 15, 2004, and December 29, 2004. An additional calibration for vanadium was performed on December 17, 2004. The initial calibrations were performed using four calibration standards resulting in r^2 values greater than 0.995. The absolute value of the intercepts was less than 3 times the MDL. Calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration verification checks were made at the required frequency resulting in seven CCVs for uranium and nine CCVs for vanadium. All calibration checks met the acceptance criteria. A reporting limit verification check was made at the required frequency to verify the linearity of the calibration curve near the practical quantitation limit. The interference check results were within the acceptance criteria with the exception of the vanadium on December 17, 2005. There were no sample results associated with this check. The mass calibration and resolution was checked at the beginning of each analytical run in accordance with the procedure. Internal standard recoveries were stable and within acceptance ranges.

Method and Calibration Blanks

All initial and continuing calibration blanks were below the practical quantitation limits for all method 6010B and 6020 analytes. In cases where blank concentration exceeded the instrument detection limit, the associated sample results are qualified with a “U” flag (not detected) when the sample result is greater than the instrument detection limit but less than 5 times the blank concentration. The ammonia as N, nitrate+nitrite as N, and sulfate method blanks, and initial and continuing calibration blanks were below the method detection limits.

Inductively Coupled Plasma (ICP) Interference Check Sample (ICS) Analysis

ICP interference check samples were analyzed at the required frequency and all results met the acceptance criteria with the exception of vanadium. Vanadium results that are greater than the method detection limit are qualified with a “J” flag (estimated) because of matrix interference.

Matrix Spike Analysis

The matrix spike and matrix spike duplicate recoveries met the acceptance criteria for all analytes.

Laboratory Replicate Analysis

The relative percent difference (RPD) values for the matrix spike duplicate sample results for all analytes were less than 20 percent.

Laboratory Control Sample

Laboratory control samples were analyzed at the correct frequency with acceptable results for all analysis categories.

Metals Serial Dilution

Serial dilutions were prepared and analyzed for all method 6010B and 6020 analytes to monitor chemical or physical interferences in the sample matrix. The acceptance criteria were met for all analytes with the exception of vanadium. The data for this analyte were not evaluated because the concentration in the unspiked sample was less than one hundred times the practical quantitation limits.

Detection Limits/Dilutions

Samples were diluted in a consistent and acceptable manner when required. The required detection limits were achieved for all analytes

Completeness

Results were reported in the correct units for all analytes requested using contract-required laboratory qualifiers.

Chromatography Peak Integration

The integration of analyte peaks was reviewed for all sulfate data. There were no manual integrations performed and all peak integrations were satisfactory.

Electronic Data Deliverable (EDD) File

An EDD file arrived on January 7, 2005; the EDD validation application detected no errors in the EDD file.

Sampling Quality Control Assessment

The following information summarizes and assesses quality control for this sampling event.

Sampling Protocol

All monitor well sample results were qualified with an “F” flag in the database indicating the wells were purged and sampled using the low-flow sampling method with the exception of location 0625 which is a domestic well. Additionally, sample results from well 0764 were qualified with a “Q” flag indicating a Category II well.

Equipment Blank Assessment

The results for the equipment blank that was collected during this sampling event was below the method detection limit for all analytes.

Field Duplicate Assessment

Field duplicate samples are collected and analyzed as an indication of overall precision of the measurement process. The precision observed includes both field and laboratory precision and have more variability than laboratory duplicates which measure only laboratory performance. Duplicate samples were collected from well 0761. The duplicate results met the EPA recommended laboratory duplicate criteria of less than 20 percent relative difference for results that are greater than five times the practical quantitation limit and are therefore acceptable.

Certification

All laboratory analytical quality control criteria were met except as qualified in this report. The data qualifiers listed on the SEEPro database reports are defined on the last page of each report. All data in this package are considered validated and available for use.

Laboratory Coordinator: Steve Donivan 2-25-05
Steve Donivan Date

Data Validation Lead: Steve Donivan 2-25-05
Steve Donivan Date

Attachment 1
Assessment of Anomalous Data

Minimums and Maximums Report

Minimums and Maximums Report

The Minimums and Maximums Report is generated by a data validation application (DataVal) used to query the SEEPro database. The data validation application compares the new data set with historical data and lists all new data that fall outside the historical data range. Values listed in the report are further screened using the following criteria. Results are considered valid if (1) identified low concentrations are the result of low detection limits; (2) the concentration detected is within 50 percent of historical minimum or maximum values; (3) there were fewer than 5 historical samples for comparison.

The sulfate result from location 0768 is not within 50 percent of the historical minimum value for that location. This result will be compared to data from the next sampling event.

At this time, all data from this sampling event may be considered validated and used as qualified.

SAMPLING DATA VALIDATION MINIMUMS AND MAXIMUMS REPORT -- No Field Parameters
 LAB CODE: PAR, PARAGON (Fort Collins, CO)
 LAB REQUISITION(S): 04110138
 HISTORY BEGIN DATE: comparing to all historical data
 REPORT DATE: 02/18/05 12:35:27: PM

SITE CODE	LOCATION	SAMPLE DATE	ANALYTE	<u>CURRENT</u>		<u>HISTORICAL MAXIMUM</u>		<u>HISTORICAL MINIMUM</u>		<u>COUNT</u>	
				RESULT	QUALIFIER S	RESULT	QUALIFIER S	RESULT	QUALIFIER S	N	N BELOW
MON01	0604	12/08/2004	Magnesium	11	F	12.4		11.1		12	0
MON01	0604	12/08/2004	Potassium	2.9	F	2.3		1.2	* F	12	0
MON01	0604	12/08/2004	Sodium	83	F	122		96.1		12	0
MON01	0606	12/08/2004	Calcium	150	F	660	FJ	178	L	38	0
MON01	0606	12/08/2004	Magnesium	76	F	160		96.1	L	39	0
MON01	0606	12/08/2004	Nitrate + Nitrite as Nitrogen	210	F	1080	F	215		7	0
MON01	0606	12/08/2004	Potassium	8.3	F	16.9		9.2		38	0
MON01	0606	12/08/2004	Sodium	71	F	200		85	F	39	0
MON01	0606	12/08/2004	Sulfate	390	F	1650		443	F	41	0
MON01	0619	12/07/2004	Sodium	14	F	23		16	F	12	0
MON01	0625	12/08/2004	Potassium	1.5		1.1		0.8		12	0
MON01	0625	12/08/2004	Sodium	98		127		107		13	0
MON01	0655	12/07/2004	Calcium	310	F	543	F	331		30	0
MON01	0655	12/07/2004	Magnesium	230	F	407	F	231		30	0

SAMPLING DATA VALIDATION MINIMUMS AND MAXIMUMS REPORT -- No Field Parameters
 LAB CODE: PAR, PARAGON (Fort Collins, CO)
 LAB REQUISITION(S): 04110138
 HISTORY BEGIN DATE: comparing to all historical data
 REPORT DATE: 02/18/05 12:35:28: PM

SITE CODE	LOCATION	SAMPLE DATE	ANALYTE	CURRENT			HISTORICAL MAXIMUM			HISTORICAL MINIMUM			COUNT	
				RESULT	QUALIFIERS LAB DATA		RESULT	QUALIFIERS LAB DATA		RESULT	QUALIFIERS LAB DATA		N	N BELOW
MON01	0656	12/07/2004	Calcium	29	F		116	F		50			10	0
MON01	0656	12/07/2004	Magnesium	24	F		87.1			40.9			10	0
MON01	0656	12/07/2004	Potassium	10	F		29	F		11.8			10	0
MON01	0656	12/07/2004	Sodium	74	F		260	F		104			10	0
MON01	0656	12/07/2004	Sulfate	200	F		845			241	F		16	0
MON01	0656	12/07/2004	Uranium	0.0054	F		0.0117			0.006	F		13	0
MON01	0662	12/07/2004	Calcium	110	F		395			114			15	0
MON01	0662	12/07/2004	Magnesium	53	F		149			84.6			15	0
MON01	0662	12/07/2004	Sodium	16	F		75			32.5			15	0
MON01	0662	12/07/2004	Uranium	0.28	F		0.25	F		0.013			19	0
MON01	0669	12/08/2004	Potassium	4.6	F		3.41			2.2			17	0
MON01	0669	12/08/2004	Sodium	30	F		77.4			37			17	0
MON01	0669	12/08/2004	Sulfate	130	F		460			159	F		20	0
MON01	0669	12/08/2004	Uranium	0.0072	F		0.0155			0.0076	F		18	0
MON01	0760	12/08/2004	Sulfate	84	F		127			84.2			10	0
MON01	0760	12/08/2004	Uranium	0.00019	F		0.0022			0.00034	B F		5	2
MON01	0764	12/08/2004	Sulfate	340	FQ		430	L		367	F		9	0
MON01	0765	12/08/2004	Sulfate	620	F		986			711			10	0
MON01	0768	12/08/2004	Sulfate	61	F		862			131	F		10	0

SAMPLING DATA VALIDATION MINIMUMS AND MAXIMUMS REPORT -- No Field Parameters

LAB CODE: PAR, PARAGON (Fort Collins, CO)

LAB REQUISITION(S): 04110138

HISTORY BEGIN DATE: comparing to all historical data

REPORT DATE: 02/18/05 12:35:28: PM

SITE CODE	LOCATION	SAMPLE DATE	ANALYTE	<u>CURRENT</u>		<u>HISTORICAL MAXIMUM</u>		<u>HISTORICAL MINIMUM</u>		<u>COUNT</u>	
				RESULT	QUALIFIERS LAB DATA	RESULT	QUALIFIERS LAB DATA	RESULT	QUALIFIERS LAB DATA	N	N BELOW
MON01	0770	12/07/2004	Sulfate	220	F	389		263	F	9	0
MON01	0771	12/07/2004	Sulfate	1800	F	3710		2230	F	9	0
MON01	0772	12/08/2004	Sulfate	130	F	186		138		10	0
MON01	0774	12/07/2004	Uranium	0.058	F	0.0726		0.0611	F	9	0

SAMPLING DATA VALIDATION MINIMUMS AND MAXIMUMS REPORT -- No Field Parameters

LAB CODE: PAR, PARAGON (Fort Collins, CO)

LAB REQUISITION(S): 04110138

HISTORY BEGIN DATE: comparing to all historical data

REPORT DATE: 02/18/05 12:35:28: PM

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:

- * Replicate analysis not within control limits.
- + Correlation coefficient for MSA < 0.995.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
- E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
- Z Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- C Pesticide result confirmed by GC-MS.
- M GFAA duplicate injection precision not met.
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- S Result determined by method of standard addition (MSA).
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- D Analyte determined in diluted sample.
- P > 25% difference in detected pesticide or Arochlor concentrations between 2 columns.
- X Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- Y Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- > Result above upper detection limit.
- J Estimated

DATA QUALIFIERS:

- | | | | | | |
|---|--|---|--|---|---------------------------------------|
| J | Estimated value. | F | Low flow sampling method used. | G | Possible grout contamination, pH > 9. |
| L | Less than 3 bore volumes purged prior to sampling. | R | Unusable result. | X | Location is undefined. |
| U | Parameter analyzed for but was not detected. | Q | Qualitative result due to sampling technique | | |

Anomalous Data Review Checksheet

Attachment 2
Data Presentation

Ground Water Quality Data

Ground Water Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site

REPORT DATE: 2/22/2005

Location: 0604 (well)

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Alkalinity, Total (As CaCO3)	mg/L	12/8/2004	0001	13	-	28	190		F	#		
Ammonia Total as N	mg/L	12/8/2004	0001	13	-	28	0.1	U	F	#	0.1	
Calcium	mg/L	12/8/2004	0001	13	-	28	19		F	#	0.0026	
Magnesium	mg/L	12/8/2004	0001	13	-	28	11		F	#	0.0042	
Nitrate + Nitrite as Nitrogen	mg/L	12/8/2004	0001	13	-	28	0.028		F	#	0.01	
Oxidation Reduction Potential	mV	12/8/2004	N001	13	-	28	29		F	#		
pH	s.u.	12/8/2004	N001	13	-	28	8.26		F	#		
Potassium	mg/L	12/8/2004	0001	13	-	28	2.9		F	#	0.064	
Sodium	mg/L	12/8/2004	0001	13	-	28	83		F	#	0.0046	
Specific Conductance	umhos/cm	12/8/2004	N001	13	-	28	643		F	#		
Sulfate	mg/L	12/8/2004	0001	13	-	28	100		F	#	2.5	
Temperature	C	12/8/2004	N001	13	-	28	14.7		F	#		
Turbidity	NTU	12/8/2004	N001	13	-	28	4.45		F	#		
Uranium	mg/L	12/8/2004	0001	13	-	28	0.0017		F	#	0.0000083	
Vanadium	mg/L	12/8/2004	0001	13	-	28	0.0017		FJ	#	0.00012	

Ground Water Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
 REPORT DATE: 2/22/2005
 Location: 0606 (well)

Parameter	Units	Sample		Depth Range			Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data		
Alkalinity, Total (As CaCO3)	mg/L	12/8/2004	0001	32	-	42	225	F	#		
Ammonia Total as N	mg/L	12/8/2004	0001	32	-	42	140	F	#	20	
Calcium	mg/L	12/8/2004	0001	32	-	42	150	F	#	0.0052	
Magnesium	mg/L	12/8/2004	0001	32	-	42	76	F	#	0.0084	
Nitrate + Nitrite as Nitrogen	mg/L	12/8/2004	0001	32	-	42	210	F	#	2	
Oxidation Reduction Potential	mV	12/8/2004	N001	32	-	42	53	F	#		
pH	s.u.	12/8/2004	N001	32	-	42	7.3	F	#		
Potassium	mg/L	12/8/2004	0001	32	-	42	8.3	F	#	0.13	
Sodium	mg/L	12/8/2004	0001	32	-	42	71	F	#	0.0092	
Specific Conductance	umhos/cm	12/8/2004	N001	32	-	42	2838	F	#		
Sulfate	mg/L	12/8/2004	0001	32	-	42	390	F	#	25	
Temperature	C	12/8/2004	N001	32	-	42	14.02	F	#		
Turbidity	NTU	12/8/2004	N001	32	-	42	0.32	F	#		
Uranium	mg/L	12/8/2004	0001	32	-	42	0.0087	F	#	0.0000083	
Vanadium	mg/L	12/8/2004	0001	32	-	42	0.00042	FJ	#	0.00012	

Ground Water Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
 REPORT DATE: 2/22/2005
 Location: 0619 (well)

Parameter	Units	Sample		Depth Range			Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data		
Alkalinity, Total (As CaCO3)	mg/L	12/7/2004	0001	103.9	-	153.9	156		F	#	
Ammonia Total as N	mg/L	12/7/2004	0001	103.9	-	153.9	0.1	U	F	#	0.1
Calcium	mg/L	12/7/2004	0001	103.9	-	153.9	41		F	#	0.0026
Magnesium	mg/L	12/7/2004	0001	103.9	-	153.9	23		F	#	0.0042
Nitrate + Nitrite as Nitrogen	mg/L	12/7/2004	0001	103.9	-	153.9	2.8		F	#	0.02
Oxidation Reduction Potential	mV	12/7/2004	N001	103.9	-	153.9	117		F	#	
pH	s.u.	12/7/2004	N001	103.9	-	153.9	7.85		F	#	
Potassium	mg/L	12/7/2004	0001	103.9	-	153.9	2.4		F	#	0.064
Sodium	mg/L	12/7/2004	0001	103.9	-	153.9	14		F	#	0.0046
Specific Conductance	umhos/cm	12/7/2004	N001	103.9	-	153.9	464		F	#	
Sulfate	mg/L	12/7/2004	0001	103.9	-	153.9	55		F	#	2.5
Temperature	C	12/7/2004	N001	103.9	-	153.9	13.9		F	#	
Turbidity	NTU	12/7/2004	N001	103.9	-	153.9	2.02		F	#	
Uranium	mg/L	12/7/2004	0001	103.9	-	153.9	0.055		F	#	0.0000083
Vanadium	mg/L	12/7/2004	0001	103.9	-	153.9	0.022		FJ	#	0.00012

Ground Water Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
 REPORT DATE: 2/22/2005
 Location: 0625 (well)

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID			Lab	Data QA		
Alkalinity, Total (As CaCO3)	mg/L	12/8/2004	N001	-	198		#		
Ammonia Total as N	mg/L	12/8/2004	0001	-	0.1	U	#	0.1	
Calcium	mg/L	12/8/2004	0001	-	2.9		#	0.0026	
Magnesium	mg/L	12/8/2004	0001	-	2.9		#	0.0042	
Nitrate + Nitrite as Nitrogen	mg/L	12/8/2004	0001	-	0.01	U	#	0.01	
Oxidation Reduction Potential	mV	12/8/2004	N001	-	2		#		
pH	s.u.	12/8/2004	N001	-	8.93		#		
Potassium	mg/L	12/8/2004	0001	-	1.5		#	0.064	
Sodium	mg/L	12/8/2004	0001	-	98		#	0.023	
Specific Conductance	umhos /cm	12/8/2004	N001	-	558		#		
Sulfate	mg/L	12/8/2004	0001	-	54		#	2.5	
Temperature	C	12/8/2004	N001	-	13.7		#		
Turbidity	NTU	12/8/2004	N001	-	0.98		#		
Uranium	mg/L	12/8/2004	0001	-	0.00014		U #	0.0000083	
Vanadium	mg/L	12/8/2004	0001	-	0.00012	U	#	0.00012	

Ground Water Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
 REPORT DATE: 2/22/2005
 Location: 0655 (well)

Parameter	Units	Sample		Depth Range			Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data		
Alkalinity, Total (As CaCO3)	mg/L	12/7/2004	0001	38	-	58	269	F	#		
Ammonia Total as N	mg/L	12/7/2004	0001	38	-	58	87	F	#	20	
Calcium	mg/L	12/7/2004	0001	38	-	58	310	F	#	0.013	
Magnesium	mg/L	12/7/2004	0001	38	-	58	230	F	#	0.021	
Nitrate + Nitrite as Nitrogen	mg/L	12/7/2004	0001	38	-	58	120	F	#	1	
Oxidation Reduction Potential	mV	12/7/2004	N001	38	-	58	136	F	#		
pH	s.u.	12/7/2004	N001	38	-	58	7.33	F	#		
Potassium	mg/L	12/7/2004	0001	38	-	58	21	F	#	0.32	
Sodium	mg/L	12/7/2004	0001	38	-	58	130	F	#	0.023	
Specific Conductance	umhos/cm	12/7/2004	N001	38	-	58	3844	F	#		
Sulfate	mg/L	12/7/2004	0001	38	-	58	1600	F	#	25	
Temperature	C	12/7/2004	N001	38	-	58	14.91	F	#		
Turbidity	NTU	12/7/2004	N001	38	-	58	0.23	F	#		
Uranium	mg/L	12/7/2004	0001	38	-	58	0.015	F	#	0.000083	
Vanadium	mg/L	12/7/2004	0001	38	-	58	0.0055	FJ	#	0.00012	

Ground Water Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
 REPORT DATE: 2/22/2005
 Location: 0656 (well)

Parameter	Units	Sample		Depth Range			Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data		
Alkalinity, Total (As CaCO3)	mg/L	12/7/2004	0001	38	-	58	230	F	#		
Ammonia Total as N	mg/L	12/7/2004	0001	38	-	58	59	F	#	2	
Calcium	mg/L	12/7/2004	0001	38	-	58	29	F	#	0.0026	
Magnesium	mg/L	12/7/2004	0001	38	-	58	24	F	#	0.0042	
Nitrate + Nitrite as Nitrogen	mg/L	12/7/2004	0001	38	-	58	24	F	#	0.2	
Oxidation Reduction Potential	mV	12/7/2004	N001	38	-	58	107	F	#		
pH	s.u.	12/7/2004	N001	38	-	58	7.92	F	#		
Potassium	mg/L	12/7/2004	0001	38	-	58	10	F	#	0.064	
Sodium	mg/L	12/7/2004	0001	38	-	58	74	F	#	0.0046	
Specific Conductance	umhos/cm	12/7/2004	N001	38	-	58	1181	F	#		
Sulfate	mg/L	12/7/2004	0001	38	-	58	200	F	#	5	
Temperature	C	12/7/2004	N001	38	-	58	14.26	F	#		
Turbidity	NTU	12/7/2004	N001	38	-	58	0.13	F	#		
Uranium	mg/L	12/7/2004	0001	38	-	58	0.0054	F	#	0.0000083	
Vanadium	mg/L	12/7/2004	0001	38	-	58	0.0004	FJ	#	0.00012	

Ground Water Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
 REPORT DATE: 2/22/2005
 Location: 0662 (well)

Parameter	Units	Sample		Depth Range		Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID	(Ft BLS)	Lab		Data	QA		
Alkalinity, Total (As CaCO3)	mg/L	12/7/2004	0001	37.5	- 67.5	201		F #		
Ammonia Total as N	mg/L	12/7/2004	0001	37.5	- 67.5	0.1	U	F #	0.1	
Calcium	mg/L	12/7/2004	0001	37.5	- 67.5	110		F #	0.0026	
Magnesium	mg/L	12/7/2004	0001	37.5	- 67.5	53		F #	0.0042	
Nitrate + Nitrite as Nitrogen	mg/L	12/7/2004	0001	37.5	- 67.5	7.2		F #	0.05	
Oxidation Reduction Potential	mV	12/7/2004	N001	37.5	- 67.5	118		F #		
pH	s.u.	12/7/2004	N001	37.5	- 67.5	7.33		F #		
Potassium	mg/L	12/7/2004	0001	37.5	- 67.5	2.7		F #	0.064	
Sodium	mg/L	12/7/2004	0001	37.5	- 67.5	16		F #	0.0046	
Specific Conductance	umhos/cm	12/7/2004	N001	37.5	- 67.5	986		F #		
Sulfate	mg/L	12/7/2004	0001	37.5	- 67.5	290		F #	2.5	
Temperature	C	12/7/2004	N001	37.5	- 67.5	14.3		F #		
Turbidity	NTU	12/7/2004	N001	37.5	- 67.5	1.33		F #		
Uranium	mg/L	12/7/2004	0001	37.5	- 67.5	0.28		F #	0.000083	
Vanadium	mg/L	12/7/2004	0001	37.5	- 67.5	0.028		FJ #	0.00012	

Ground Water Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
 REPORT DATE: 2/22/2005
 Location: 0669 (well)

Parameter	Units	Sample		Depth Range			Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data		
Alkalinity, Total (As CaCO3)	mg/L	12/8/2004	0001	34	-	54	192	F	#		
Ammonia Total as N	mg/L	12/8/2004	0001	34	-	54	2.6	F	#	0.1	
Calcium	mg/L	12/8/2004	0001	34	-	54	54	F	#	0.0026	
Magnesium	mg/L	12/8/2004	0001	34	-	54	37	F	#	0.0042	
Nitrate + Nitrite as Nitrogen	mg/L	12/8/2004	0001	34	-	54	9.5	F	#	0.05	
Oxidation Reduction Potential	mV	12/8/2004	N001	34	-	54	161	F	#		
pH	s.u.	12/8/2004	N001	34	-	54	7.71	F	#		
Potassium	mg/L	12/8/2004	0001	34	-	54	4.6	F	#	0.064	
Sodium	mg/L	12/8/2004	0001	34	-	54	30	F	#	0.0046	
Specific Conductance	umhos/cm	12/8/2004	N001	34	-	54	712	F	#		
Sulfate	mg/L	12/8/2004	0001	34	-	54	130	F	#	2.5	
Temperature	C	12/8/2004	N001	34	-	54	14.76	F	#		
Turbidity	NTU	12/8/2004	N001	34	-	54	0.58	F	#		
Uranium	mg/L	12/8/2004	0001	34	-	54	0.0072	F	#	0.0000083	
Vanadium	mg/L	12/8/2004	0001	34	-	54	0.055	FJ	#	0.00012	

Ground Water Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
 REPORT DATE: 2/22/2005
 Location: 0760 (well)

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Alkalinity, Total (As CaCO3)	mg/L	12/8/2004	0001	55	-	75	170		F	#		
Ammonia Total as N	mg/L	12/8/2004	0001	55	-	75	0.1	U	F	#	0.1	
Calcium	mg/L	12/8/2004	0001	55	-	75	20		F	#	0.0026	
Magnesium	mg/L	12/8/2004	0001	55	-	75	14		F	#	0.0042	
Nitrate + Nitrite as Nitrogen	mg/L	12/8/2004	0001	55	-	75	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	12/8/2004	N001	55	-	75	-190		F	#		
pH	s.u.	12/8/2004	N001	55	-	75	8.36		F	#		
Potassium	mg/L	12/8/2004	0001	55	-	75	3.1		F	#	0.064	
Sodium	mg/L	12/8/2004	0001	55	-	75	62		F	#	0.0046	
Specific Conductance	umhos/cm	12/8/2004	N001	55	-	75	527		F	#		
Sulfate	mg/L	12/8/2004	0001	55	-	75	84		F	#	2.5	
Temperature	C	12/8/2004	N001	55	-	75	14.65		F	#		
Turbidity	NTU	12/8/2004	N001	55	-	75	163		F	#		
Uranium	mg/L	12/8/2004	0001	55	-	75	0.00019		F	#	0.0000083	
Vanadium	mg/L	12/8/2004	0001	55	-	75	0.00012	B	FJ	#	0.00012	

Ground Water Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
 REPORT DATE: 2/22/2005
 Location: 0761 (well)

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	12/8/2004	0001	39	-	49	188		F	#		
Ammonia Total as N	mg/L	12/8/2004	0001	39	-	49	0.1	U	F	#	0.1	
Ammonia Total as N	mg/L	12/8/2004	0002	39	-	49	0.1	U	F	#	0.1	
Calcium	mg/L	12/8/2004	0001	39	-	49	130		F	#	0.0026	
Calcium	mg/L	12/8/2004	0002	39	-	49	130		F	#	0.0026	
Magnesium	mg/L	12/8/2004	0001	39	-	49	84		F	#	0.0042	
Magnesium	mg/L	12/8/2004	0002	39	-	49	84		F	#	0.0042	
Nitrate + Nitrite as Nitrogen	mg/L	12/8/2004	0001	39	-	49	24		F	#	0.2	
Nitrate + Nitrite as Nitrogen	mg/L	12/8/2004	0002	39	-	49	24		F	#	0.2	
Oxidation Reduction Potential	mV	12/8/2004	N001	39	-	49	116		F	#		
pH	s.u.	12/8/2004	N001	39	-	49	7.6		F	#		
Potassium	mg/L	12/8/2004	0001	39	-	49	1.5		F	#	0.064	
Potassium	mg/L	12/8/2004	0002	39	-	49	1.6		F	#	0.064	
Sodium	mg/L	12/8/2004	0001	39	-	49	51		F	#	0.0046	
Sodium	mg/L	12/8/2004	0002	39	-	49	50		F	#	0.0046	
Specific Conductance	umhos/cm	12/8/2004	N001	39	-	49	1434		F	#		
Sulfate	mg/L	12/8/2004	0001	39	-	49	480		F	#	5	
Sulfate	mg/L	12/8/2004	0002	39	-	49	480		F	#	5	

Ground Water Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
 REPORT DATE: 2/22/2005
 Location: 0761 (well)

Temperature	C	12/8/2004	N001	39	-	49	15.7	F	#	
Turbidity	NTU	12/8/2004	N001	39	-	49	6.85	F	#	
Uranium	mg/L	12/8/2004	0001	39	-	49	0.029	F	#	0.0000083
Uranium	mg/L	12/8/2004	0002	39	-	49	0.028	F	#	0.0000083
Vanadium	mg/L	12/8/2004	0001	39	-	49	0.0013	FJ	#	0.00012
Vanadium	mg/L	12/8/2004	0002	39	-	49	0.0013	FJ	#	0.00012

Ground Water Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
 REPORT DATE: 2/22/2005
 Location: 0762 (well)

Parameter	Units	Sample		Depth Range			Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data		
Alkalinity, Total (As CaCO3)	mg/L	12/8/2004	0001	29	-	49	222		F	#	
Ammonia Total as N	mg/L	12/8/2004	0001	29	-	49	0.1	U	F	#	0.1
Calcium	mg/L	12/8/2004	0001	29	-	49	190		F	#	0.0052
Magnesium	mg/L	12/8/2004	0001	29	-	49	160		F	#	0.0084
Nitrate + Nitrite as Nitrogen	mg/L	12/8/2004	0001	29	-	49	56		F	#	0.5
Oxidation Reduction Potential	mV	12/8/2004	N001	29	-	49	135		F	#	
pH	s.u.	12/8/2004	N001	29	-	49	7.67		F	#	
Potassium	mg/L	12/8/2004	0001	29	-	49	6.5		F	#	0.13
Sodium	mg/L	12/8/2004	0001	29	-	49	300		F	#	0.046
Specific Conductance	umhos/cm	12/8/2004	N001	29	-	49	3410		F	#	
Sulfate	mg/L	12/8/2004	0001	29	-	49	1400		F	#	25
Temperature	C	12/8/2004	N001	29	-	49	15.7		F	#	
Turbidity	NTU	12/8/2004	N001	29	-	49	6.63		F	#	
Uranium	mg/L	12/8/2004	0001	29	-	49	0.011		F	#	0.0000083
Vanadium	mg/L	12/8/2004	0001	29	-	49	0.0056		FJ	#	0.00012

Ground Water Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
 REPORT DATE: 2/22/2005
 Location: 0764 (well)

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	12/8/2004	0001	47	-	52	206		FQ	#		
Ammonia Total as N	mg/L	12/8/2004	0001	47	-	52	0.1	U	FQ	#	0.1	
Calcium	mg/L	12/8/2004	0001	47	-	52	120		FQ	#	0.0026	
Magnesium	mg/L	12/8/2004	0001	47	-	52	83		FQ	#	0.0042	
Nitrate + Nitrite as Nitrogen	mg/L	12/8/2004	0001	47	-	52	46		FQ	#	0.5	
Oxidation Reduction Potential	mV	12/8/2004	N001	47	-	52	190		FQ	#		
pH	s.u.	12/8/2004	N001	47	-	52	7.8		FQ	#		
Potassium	mg/L	12/8/2004	0001	47	-	52	2.1		FQ	#	0.064	
Sodium	mg/L	12/8/2004	0001	47	-	52	44		FQ	#	0.0046	
Specific Conductance	umhos/cm	12/8/2004	N001	47	-	52	1334		FQ	#		
Sulfate	mg/L	12/8/2004	0001	47	-	52	340		FQ	#	5	
Temperature	C	12/8/2004	N001	47	-	52	13.85		FQ	#		
Turbidity	NTU	12/8/2004	N001	47	-	52	4.83		FQ	#		
Uranium	mg/L	12/8/2004	0001	47	-	52	0.015		FQ	#	0.0000083	
Vanadium	mg/L	12/8/2004	0001	47	-	52	0.011		FQJ	#	0.00012	

Ground Water Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
 REPORT DATE: 2/22/2005
 Location: 0765 (well)

Parameter	Units	Sample		Depth Range			Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data QA		
Alkalinity, Total (As CaCO3)	mg/L	12/8/2004	0001	58.6	-	88.7	247	F	#		
Ammonia Total as N	mg/L	12/8/2004	0001	58.6	-	88.7	130	F	#	20	
Calcium	mg/L	12/8/2004	0001	58.6	-	88.7	130	F	#	0.0026	
Magnesium	mg/L	12/8/2004	0001	58.6	-	88.7	99	F	#	0.0042	
Nitrate + Nitrite as Nitrogen	mg/L	12/8/2004	0001	58.6	-	88.7	130	F	#	1	
Oxidation Reduction Potential	mV	12/8/2004	N001	58.6	-	88.7	147	F	#		
pH	s.u.	12/8/2004	N001	58.6	-	88.7	7.49	F	#		
Potassium	mg/L	12/8/2004	0001	58.6	-	88.7	19	F	#	0.064	
Sodium	mg/L	12/8/2004	0001	58.6	-	88.7	92	F	#	0.023	
Specific Conductance	umhos/cm	12/8/2004	N001	58.6	-	88.7	2779	F	#		
Sulfate	mg/L	12/8/2004	0001	58.6	-	88.7	620	F	#	25	
Temperature	C	12/8/2004	N001	58.6	-	88.7	14.94	F	#		
Turbidity	NTU	12/8/2004	N001	58.6	-	88.7	0.29	F	#		
Uranium	mg/L	12/8/2004	0001	58.6	-	88.7	0.011	F	#	0.0000083	
Vanadium	mg/L	12/8/2004	0001	58.6	-	88.7	0.0056	FJ	#	0.00012	

Ground Water Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
 REPORT DATE: 2/22/2005
 Location: 0767 (well)

Parameter	Units	Sample		Depth Range			Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data QA		
Alkalinity, Total (As CaCO3)	mg/L	12/8/2004	0001	43.5	-	63.5	193	F	#		
Ammonia Total as N	mg/L	12/8/2004	0001	43.5	-	63.5	0.11	F	#	0.1	
Calcium	mg/L	12/8/2004	0001	43.5	-	63.5	34	F	#	0.0026	
Magnesium	mg/L	12/8/2004	0001	43.5	-	63.5	15	F	#	0.0042	
Nitrate + Nitrite as Nitrogen	mg/L	12/8/2004	0001	43.5	-	63.5	0.01	U	F	#	0.01
Oxidation Reduction Potential	mV	12/8/2004	N001	43.5	-	63.5	-108	F	#		
pH	s.u.	12/8/2004	N001	43.5	-	63.5	8.28	F	#		
Potassium	mg/L	12/8/2004	0001	43.5	-	63.5	3.1	F	#	0.064	
Sodium	mg/L	12/8/2004	0001	43.5	-	63.5	22	F	#	0.0046	
Specific Conductance	umhos/cm	12/8/2004	N001	43.5	-	63.5	421	F	#		
Sulfate	mg/L	12/8/2004	0001	43.5	-	63.5	29	F	#	2.5	
Temperature	C	12/8/2004	N001	43.5	-	63.5	14.8	F	#		
Turbidity	NTU	12/8/2004	N001	43.5	-	63.5	6.27	F	#		
Uranium	mg/L	12/8/2004	0001	43.5	-	63.5	0.00033	F	#	0.0000083	
Vanadium	mg/L	12/8/2004	0001	43.5	-	63.5	0.00012	U	F	#	0.00012

Ground Water Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
 REPORT DATE: 2/22/2005
 Location: 0768 (well)

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Alkalinity, Total (As CaCO3)	mg/L	12/8/2004	0001	24.4	-	44.4	173		F	#		
Ammonia Total as N	mg/L	12/8/2004	0001	24.4	-	44.4	0.54		F	#	0.1	
Calcium	mg/L	12/8/2004	0001	24.4	-	44.4	26		F	#	0.0026	
Magnesium	mg/L	12/8/2004	0001	24.4	-	44.4	20		F	#	0.0042	
Nitrate + Nitrite as Nitrogen	mg/L	12/8/2004	0001	24.4	-	44.4	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	12/8/2004	N001	24.4	-	44.4	-203		F	#		
pH	s.u.	12/8/2004	N001	24.4	-	44.4	8.5		F	#		
Potassium	mg/L	12/8/2004	0001	24.4	-	44.4	2.7		F	#	0.064	
Sodium	mg/L	12/8/2004	0001	24.4	-	44.4	41		F	#	0.0046	
Specific Conductance	umhos/cm	12/8/2004	N001	24.4	-	44.4	497		F	#		
Sulfate	mg/L	12/8/2004	0001	24.4	-	44.4	61		F	#	2.5	
Temperature	C	12/8/2004	N001	24.4	-	44.4	14.9		F	#		
Turbidity	NTU	12/8/2004	N001	24.4	-	44.4	8.59		F	#		
Uranium	mg/L	12/8/2004	0001	24.4	-	44.4	0.000041	B	UF	#	0.0000083	
Vanadium	mg/L	12/8/2004	0001	24.4	-	44.4	0.00012	U	F	#	0.00012	

Ground Water Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
 REPORT DATE: 2/22/2005
 Location: 0770 (well)

Parameter	Units	Sample		Depth Range			Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data		
Alkalinity, Total (As CaCO3)	mg/L	12/7/2004	0001	54.9	-	64.9	191	F	#		
Ammonia Total as N	mg/L	12/7/2004	0001	54.9	-	64.9	36	F	#	1	
Calcium	mg/L	12/7/2004	0001	54.9	-	64.9	39	F	#	0.0026	
Magnesium	mg/L	12/7/2004	0001	54.9	-	64.9	33	F	#	0.0042	
Nitrate + Nitrite as Nitrogen	mg/L	12/7/2004	0001	54.9	-	64.9	23	F	#	0.2	
Oxidation Reduction Potential	mV	12/7/2004	N001	54.9	-	64.9	88.4	F	#		
pH	s.u.	12/7/2004	N001	54.9	-	64.9	7.75	F	#		
Potassium	mg/L	12/7/2004	0001	54.9	-	64.9	7	F	#	0.064	
Sodium	mg/L	12/7/2004	0001	54.9	-	64.9	81	F	#	0.0046	
Specific Conductance	umhos/cm	12/7/2004	N001	54.9	-	64.9	1162	F	#		
Sulfate	mg/L	12/7/2004	0001	54.9	-	64.9	220	F	#	5	
Temperature	C	12/7/2004	N001	54.9	-	64.9	13.7	F	#		
Turbidity	NTU	12/7/2004	N001	54.9	-	64.9	2.21	F	#		
Uranium	mg/L	12/7/2004	0001	54.9	-	64.9	0.0056	F	#	0.0000083	
Vanadium	mg/L	12/7/2004	0001	54.9	-	64.9	0.00048	FJ	#	0.00012	

Ground Water Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
 REPORT DATE: 2/22/2005
 Location: 0771 (well)

Parameter	Units	Sample		Depth Range			Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data QA		
Alkalinity, Total (As CaCO3)	mg/L	12/7/2004	0001	57.4	-	77.4	299	F	#		
Ammonia Total as N	mg/L	12/7/2004	0001	57.4	-	77.4	220	F	#	20	
Calcium	mg/L	12/7/2004	0001	57.4	-	77.4	300	F	#	0.013	
Magnesium	mg/L	12/7/2004	0001	57.4	-	77.4	230	F	#	0.021	
Nitrate + Nitrite as Nitrogen	mg/L	12/7/2004	0001	57.4	-	77.4	150	F	#	1	
Oxidation Reduction Potential	mV	12/7/2004	N001	57.4	-	77.4	136	F	#		
pH	s.u.	12/7/2004	N001	57.4	-	77.4	7.36	F	#		
Potassium	mg/L	12/7/2004	0001	57.4	-	77.4	47	F	#	0.32	
Sodium	mg/L	12/7/2004	0001	57.4	-	77.4	100	F	#	0.023	
Specific Conductance	umhos/cm	12/7/2004	N001	57.4	-	77.4	4831	F	#		
Sulfate	mg/L	12/7/2004	0001	57.4	-	77.4	1800	F	#	25	
Temperature	C	12/7/2004	N001	57.4	-	77.4	13.94	F	#		
Turbidity	NTU	12/7/2004	N001	57.4	-	77.4	2.52	F	#		
Uranium	mg/L	12/7/2004	0001	57.4	-	77.4	0.018	F	#	0.000083	
Vanadium	mg/L	12/7/2004	0001	57.4	-	77.4	0.0076	FJ	#	0.00012	

Ground Water Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
 REPORT DATE: 2/22/2005
 Location: 0772 (well)

Parameter	Units	Sample		Depth Range			Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data		
Alkalinity, Total (As CaCO3)	mg/L	12/8/2004	0001	7.4	-	27.4	234	F	#		
Ammonia Total as N	mg/L	12/8/2004	0001	7.4	-	27.4	3.4	F	#	0.1	
Calcium	mg/L	12/8/2004	0001	7.4	-	27.4	17	F	#	0.0026	
Magnesium	mg/L	12/8/2004	0001	7.4	-	27.4	13	F	#	0.0042	
Nitrate + Nitrite as Nitrogen	mg/L	12/8/2004	0001	7.4	-	27.4	1.5	F	#	0.01	
Oxidation Reduction Potential	mV	12/8/2004	N001	7.4	-	27.4	115	F	#		
pH	s.u.	12/8/2004	N001	7.4	-	27.4	7.85	F	#		
Potassium	mg/L	12/8/2004	0001	7.4	-	27.4	1.9	F	#	0.064	
Sodium	mg/L	12/8/2004	0001	7.4	-	27.4	110	F	#	0.023	
Specific Conductance	umhos/cm	12/8/2004	N001	7.4	-	27.4	807	F	#		
Sulfate	mg/L	12/8/2004	0001	7.4	-	27.4	130	F	#	2.5	
Temperature	C	12/8/2004	N001	7.4	-	27.4	15.1	F	#		
Turbidity	NTU	12/8/2004	N001	7.4	-	27.4	1.29	F	#		
Uranium	mg/L	12/8/2004	0001	7.4	-	27.4	0.0062	F	#	0.0000083	
Vanadium	mg/L	12/8/2004	0001	7.4	-	27.4	0.01	FJ	#	0.00012	

Ground Water Quality Data by Location (USEE100) FOR SITE MON01, Monument Valley Processing Site
 REPORT DATE: 2/22/2005
 Location: 0774 (well)

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers			Detection Limit	Uncertainty
							Lab	Data	QA		
Alkalinity, Total (As CaCO3)	mg/L	12/7/2004	0001	45	-	55		F	#		
Ammonia Total as N	mg/L	12/7/2004	0001	45	-	55	0.1	U	F	#	0.1
Calcium	mg/L	12/7/2004	0001	45	-	55	41		F	#	0.0026
Magnesium	mg/L	12/7/2004	0001	45	-	55	24		F	#	0.0042
Nitrate + Nitrite as Nitrogen	mg/L	12/7/2004	0001	45	-	55	3.1		F	#	0.02
Oxidation Reduction Potential	mV	12/7/2004	N001	45	-	55	112		F	#	
pH	s.u.	12/7/2004	N001	45	-	55	7.79		F	#	
Potassium	mg/L	12/7/2004	0001	45	-	55	2.4		F	#	0.064
Sodium	mg/L	12/7/2004	0001	45	-	55	15		F	#	0.0046
Specific Conductance	umhos/cm	12/7/2004	N001	45	-	55	479		F	#	
Sulfate	mg/L	12/7/2004	0001	45	-	55	59		F	#	2.5
Temperature	C	12/7/2004	N001	45	-	55	15.2		F	#	
Turbidity	NTU	12/7/2004	N001	45	-	55	3.98		F	#	
Uranium	mg/L	12/7/2004	0001	45	-	55	0.058		F	#	0.0000083
Vanadium	mg/L	12/7/2004	0001	45	-	55	0.019	E	FJ	#	0.00012

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:

- * Replicate analysis not within control limits.
- > Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
- C Pesticide result confirmed by GC-MS.
- D Analyte determined in diluted sample.
- E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- J Estimated
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- P > 25% difference in detected pesticide or Arochlor concentrations between 2 columns.
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- X Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- Y Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- Z Laboratory defined (USEPA CLP organic) qualifier, see case narrative.

DATA QUALIFIERS:

- F Low flow sampling method used. G Possible grout contamination, pH > 9. J Estimated value.
- L Less than 3 bore volumes purged prior to sampling. Q Qualitative result due to sampling technique R Unusable result.
- U Parameter analyzed for but was not detected. X Location is undefined.

QA QUALIFIER: # = validated according to Quality Assurance guidelines.

Equipment Blank Data

BLANKS REPORT
 LAB CODE: PAR, PARAGON (Fort Collins, CO)
 LAB REQUISITION: 04110138
 REPORT DATE: 02/18/05 11:52:56: AM

PARAMETER	SITE CODE	LOCATION	SAMPLE DATE	ID	UNITS	RESULT	QUALIFIERS LAB DATA	DETECTION LIMIT	UNCERTAINTY	SAMPLE TYPE
Ammonia Total as N	MON01	0999	12/08/2004	0001	mg/L	0.1	U	0.1		E
Calcium	MON01	0999	12/08/2004	0001	mg/L	0.14	B U	0.0026		E
Magnesium	MON01	0999	12/08/2004	0001	mg/L	0.045	B U	0.0042		E
Nitrate + Nitrite as Nitrogen	MON01	0999	12/08/2004	0001	mg/L	0.01	U	0.01		E
Potassium	MON01	0999	12/08/2004	0001	mg/L	0.45	B U	0.064		E
Sodium	MON01	0999	12/08/2004	0001	mg/L	0.11	B U	0.0046		E
Sulfate	MON01	0999	12/08/2004	0001	mg/L	0.5	U	0.5		E
Uranium	MON01	0999	12/08/2004	0001	mg/L	0.00004	B U	0.000083		E
Vanadium	MON01	0999	12/08/2004	0001	mg/L	0.00012	U	0.00012		E

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LAB QUALIFIERS:

- * Replicate analysis not within control limits.
- + Correlation coefficient for MSA < 0.995.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
- E Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
- Z Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- H Holding time expired, value suspect.
- I Increased detection limit due to required dilution.
- C Pesticide result confirmed by GC-MS.
- M GFAA duplicate injection precision not met.
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compound (TIC).
- S Result determined by method of standard addition (MSA).

- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- D Analyte determined in diluted sample.
- P > 25% difference in detected pesticide or Arochlor concentrations between 2 columns.
- X Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- Y Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- > Result above upper detection limit.
- J Estimated

DATA QUALIFIERS:

- | | | | | | |
|---|--|---|--|---|---------------------------------------|
| J | Estimated value. | F | Low flow sampling method used. | G | Possible grout contamination, pH > 9. |
| L | Less than 3 bore volumes purged prior to sampling. | R | Unusable result. | X | Location is undefined. |
| U | Parameter analyzed for but was not detected. | Q | Qualitative result due to sampling technique | | |

SAMPLE TYPES:

- E EQUIPMENT BLANK

Static Water Level Data

STATIC WATER LEVELS (USEE700) FOR SITE MON01, Monument Valley Processing Site
 REPORT DATE: 2/22/2005

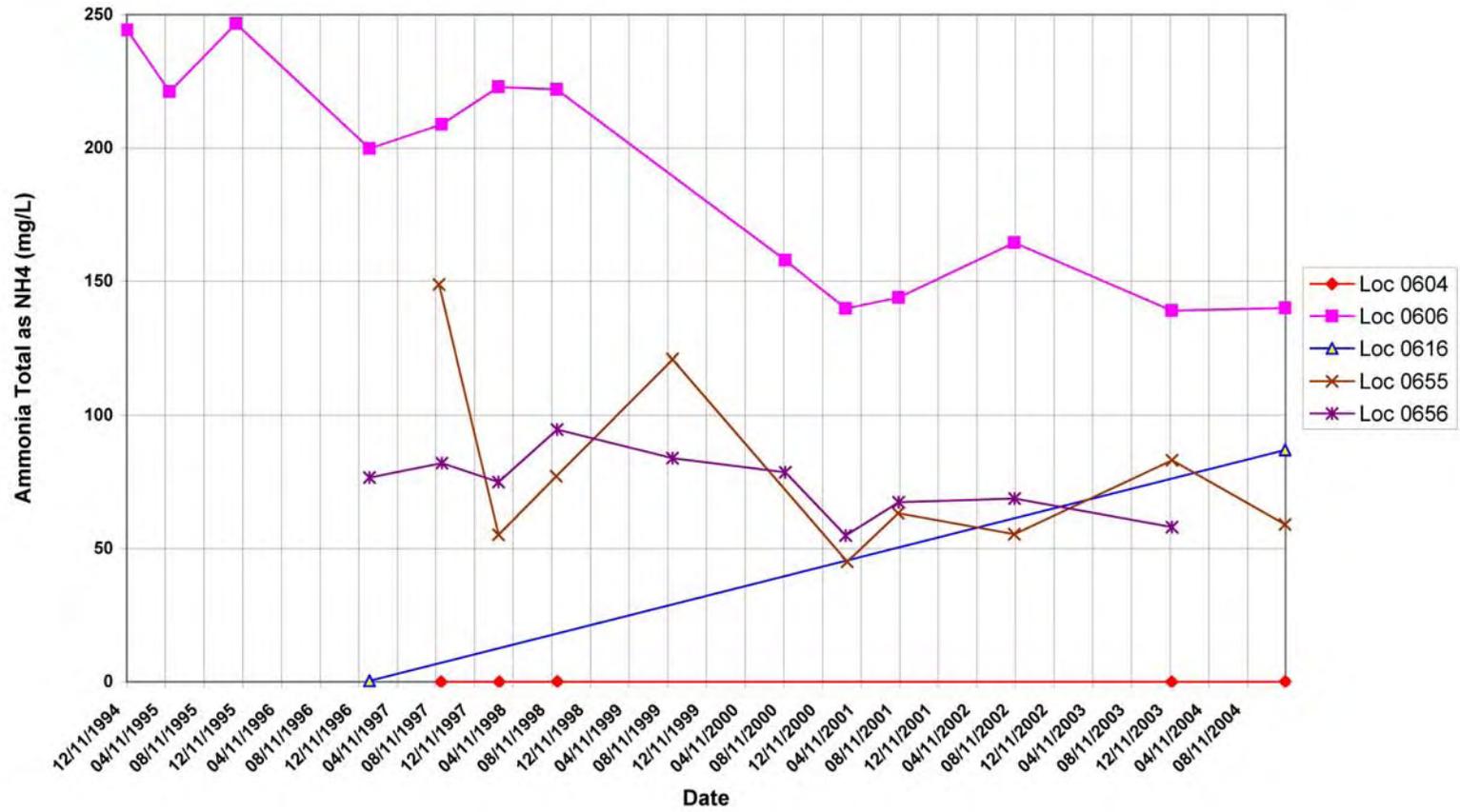
Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0604	C	4840.42	12/8/2004	10:10:00	8.95	4831.47	
0606	D	4864.73	12/8/2004	14:52:00	36.04	4828.69	
0619	O	4888.63	12/7/2004	16:58:00	56.98	4831.65	
0625	C	4841.61	12/8/2004	15:00:00			F
0655	D	4862.06	12/7/2004	14:19:00	39.72	4822.34	
0656	D	4856.33	12/7/2004	17:10:00	36.48	4819.85	
0662	D	4878.56	12/7/2004	15:44:00	48.96	4829.6	
0669	D	4867.19	12/8/2004	09:58:00	49.72	4817.47	
0760	D	4814.8	12/8/2004	12:36:00	25.59	4789.21	
0761	D	4835.02	12/8/2004	10:50:00	43.27	4791.75	
0762	D	4820.74	12/8/2004	12:20:00	32.55	4788.19	
0764	D	4851.53	12/8/2004	09:00:00	49.75	4801.78	
0765	D	4848.45	12/8/2004	11:00:00	35.41	4813.04	
0767	D	4808.25	12/8/2004	13:54:00	7.01	4801.24	
0768	D	4820.73	12/8/2004	15:40:00	14.39	4806.34	
0770	D	4857.26	12/7/2004	16:25:00	33.02	4824.24	
0771	D	4863.26	12/7/2004	15:17:00	41.84	4821.42	
0772	O	4847.6	12/8/2004	08:57:00	12.12	4835.48	
0774	O	4880.14	12/7/2004	16:24:00	48.76	4831.38	

FLOW CODES: C CROSS GRADIENT D DOWN GRADIENT U UPGRADIENT
 WATER LEVEL FLAGS:

Time Versus Concentration Graphs

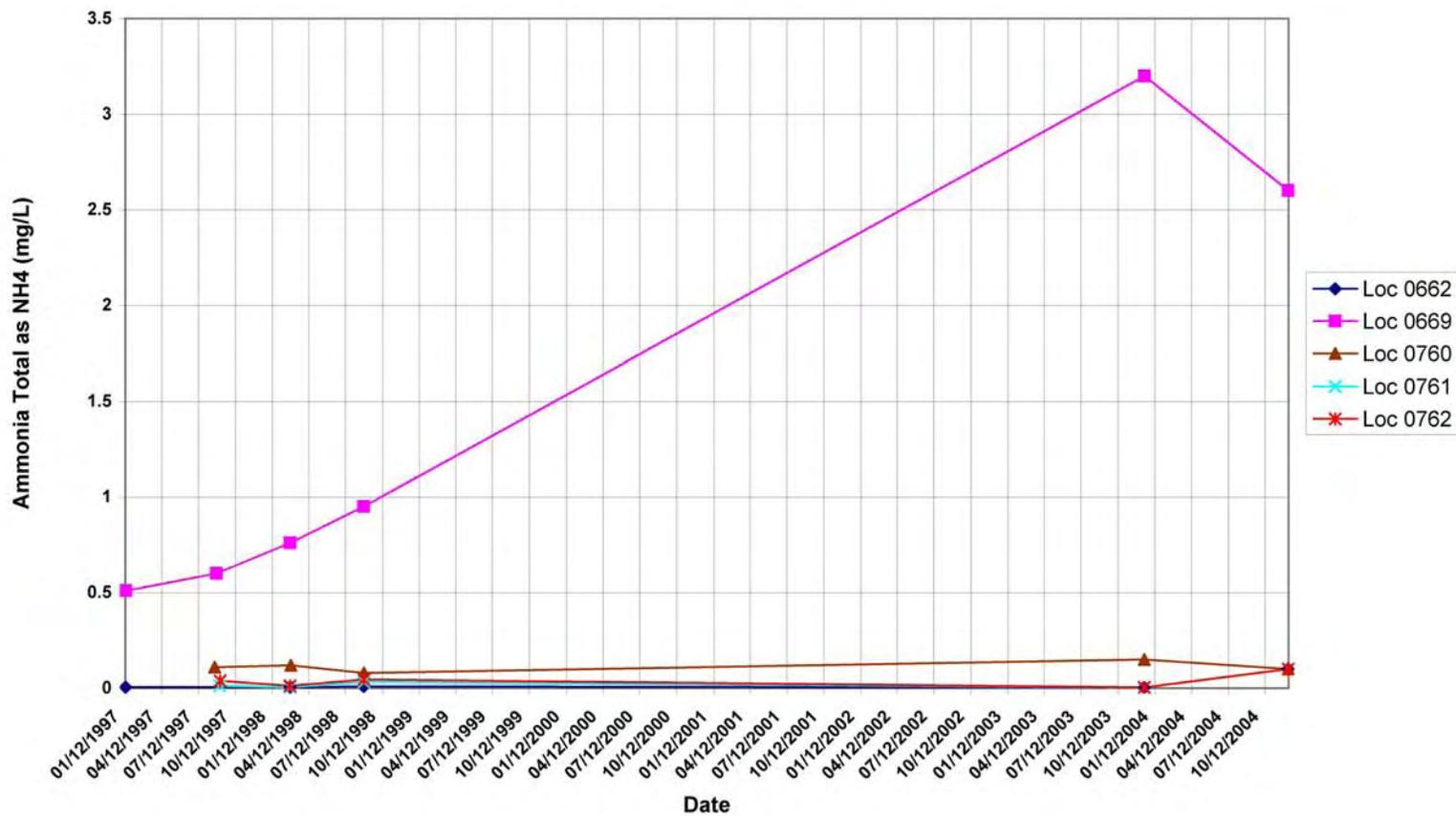
Monument Valley Processing Site (MON01)

Ammonia Total as N Concentration



Monument Valley Processing Site (MON01)

Ammonia Total as N Concentration



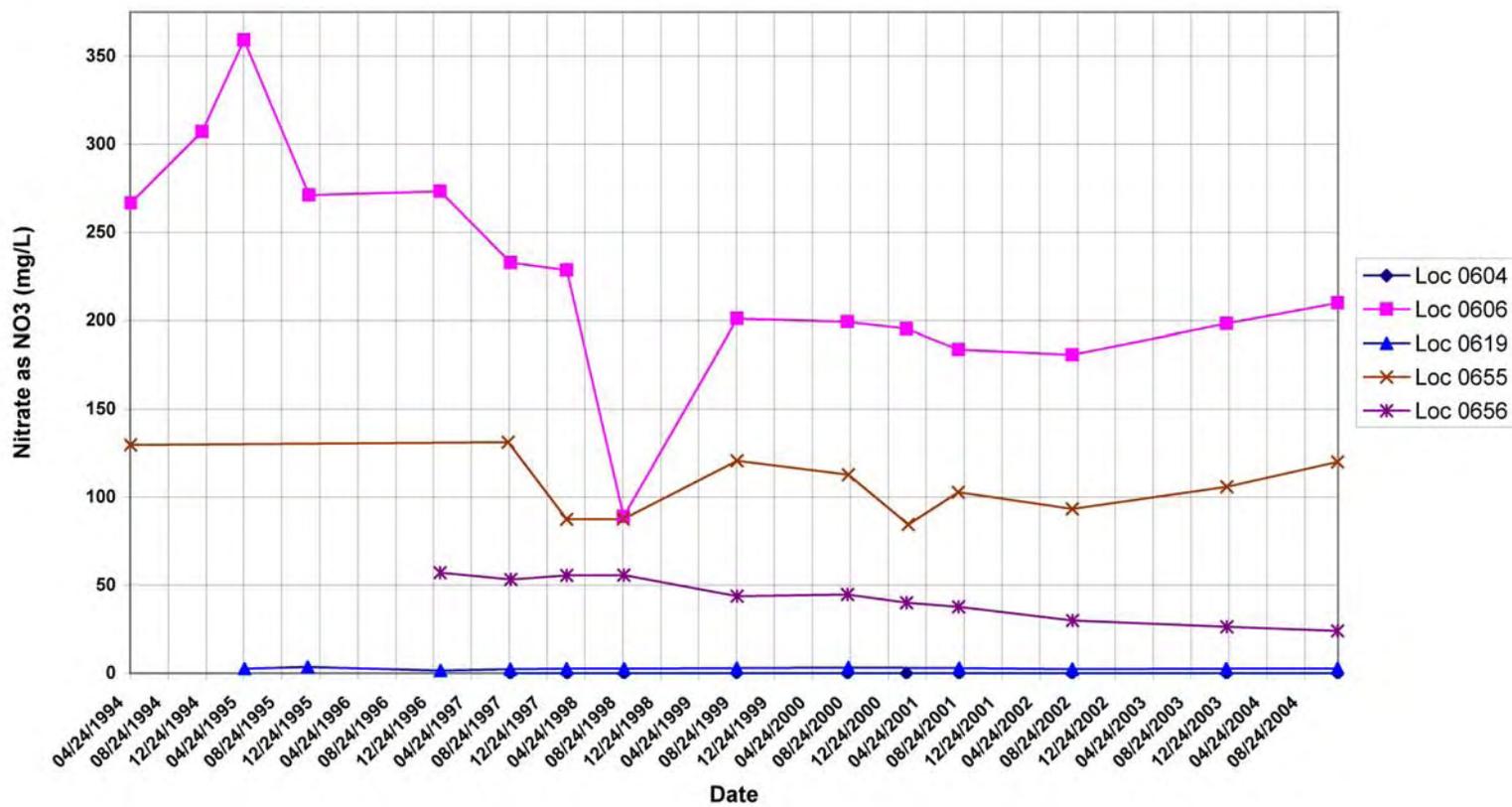
Monument Valley Processing Site (MON01)

Ammonia Total as N Concentration



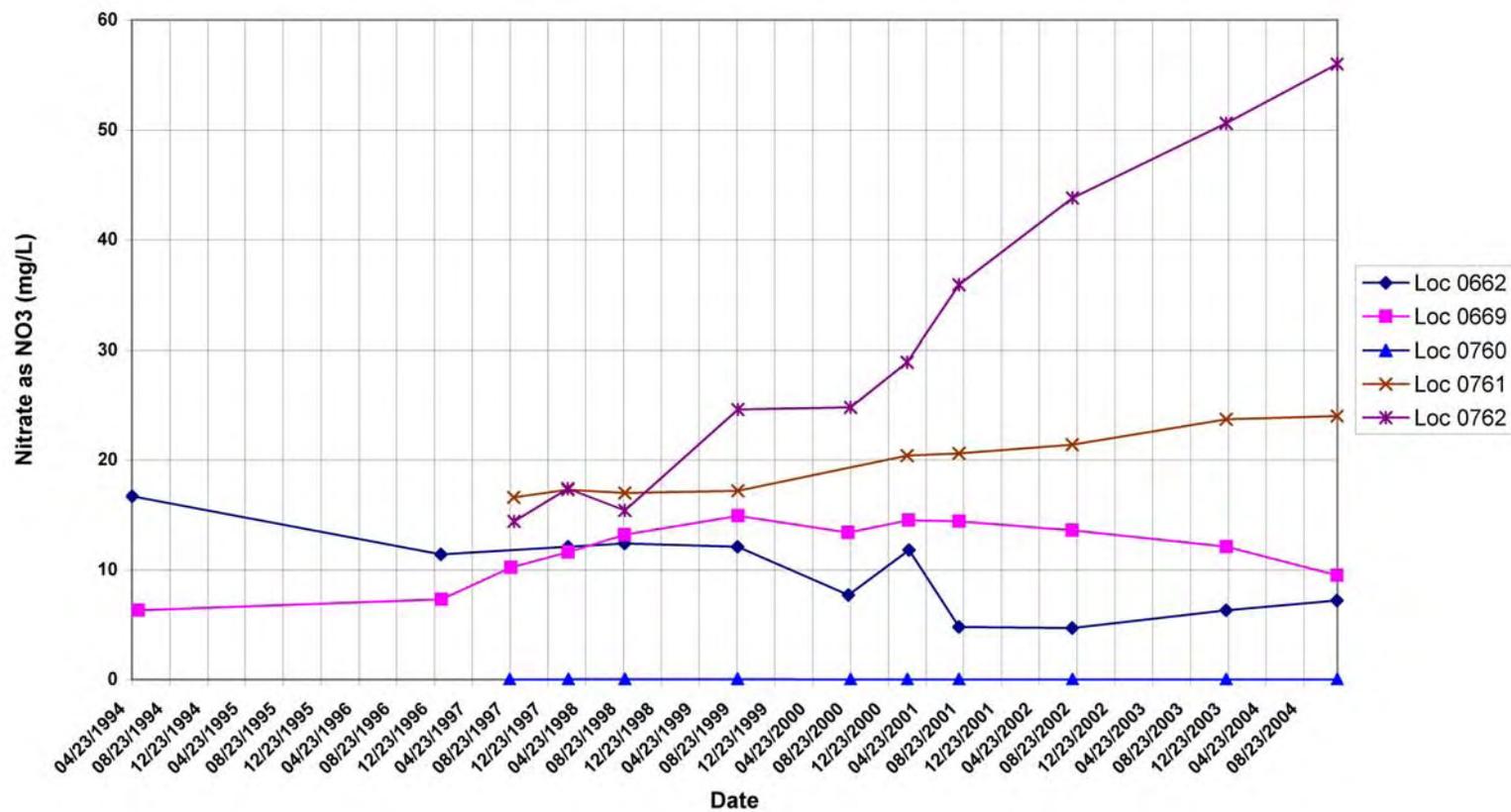
Monument Valley Processing Site (MON01)

Nitrate + Nitrite as Nitrogen Concentration
MCL = 10 mg/L



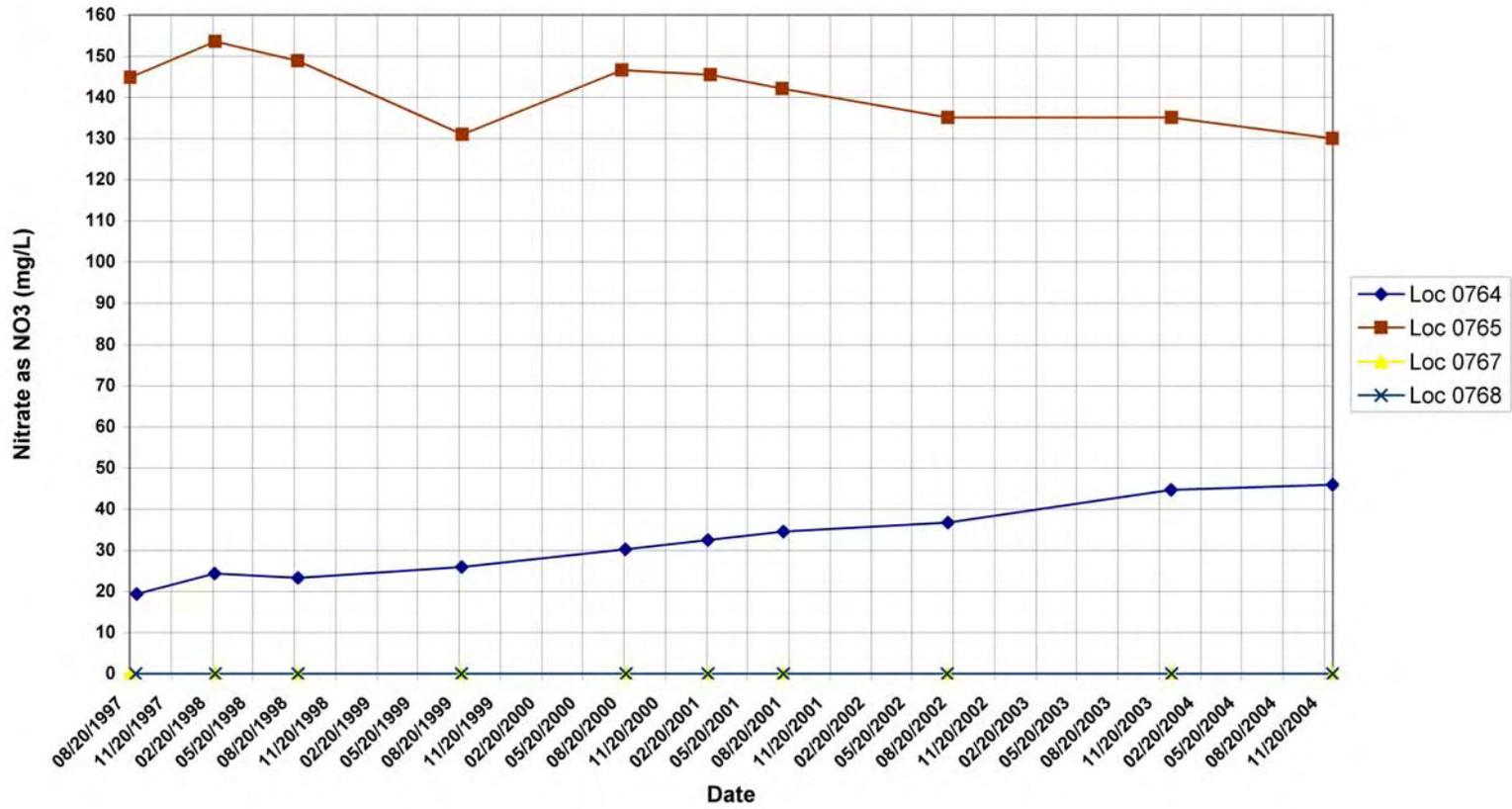
Monument Valley Processing Site (MON01)

Nitrate + Nitrite as Nitrogen Concentration
MCL = 10 mg/L



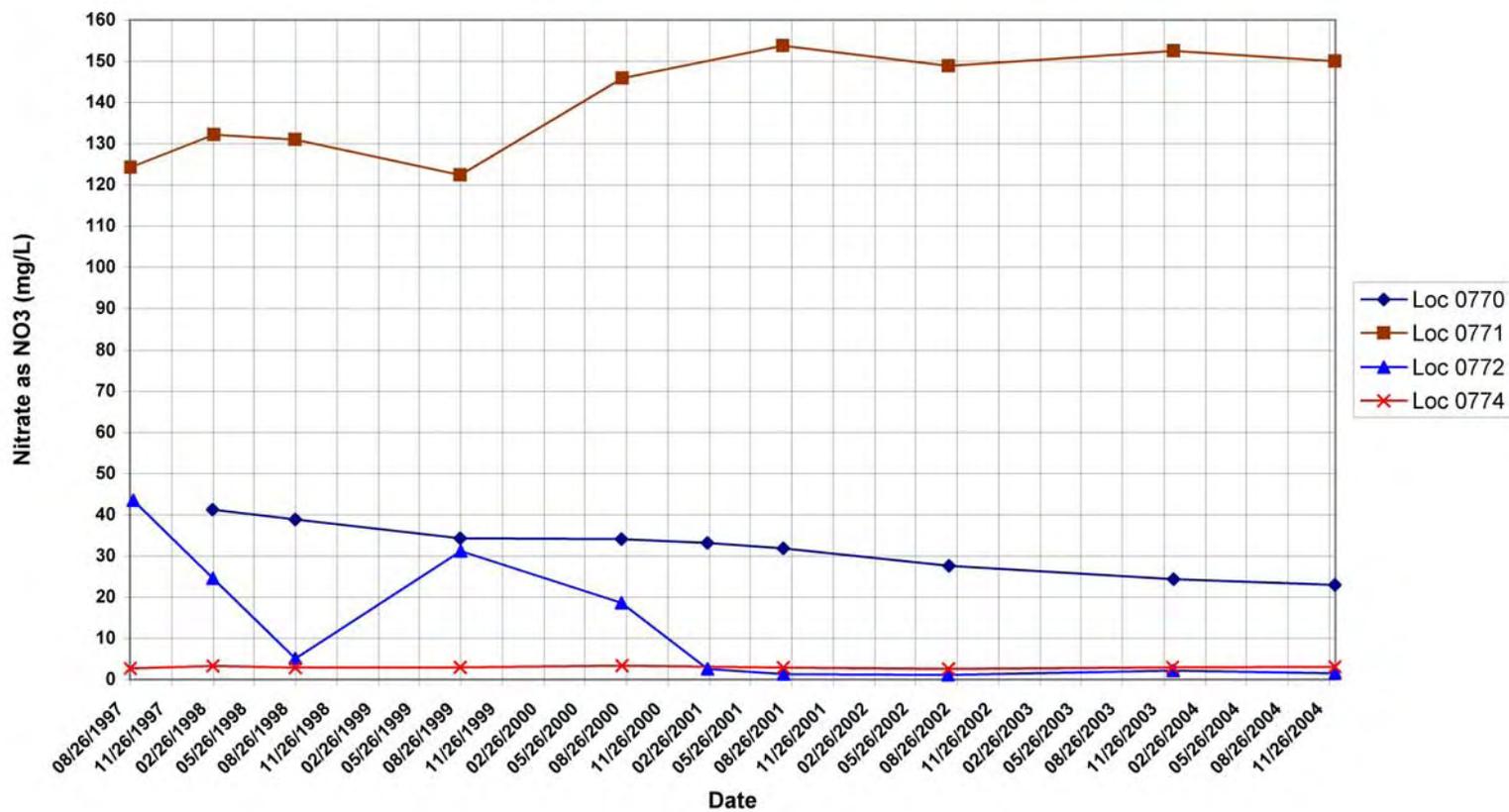
Monument Valley Processing Site (MON01)

Nitrate + Nitrite as Nitrogen Concentration
MCL = 10 mg/L



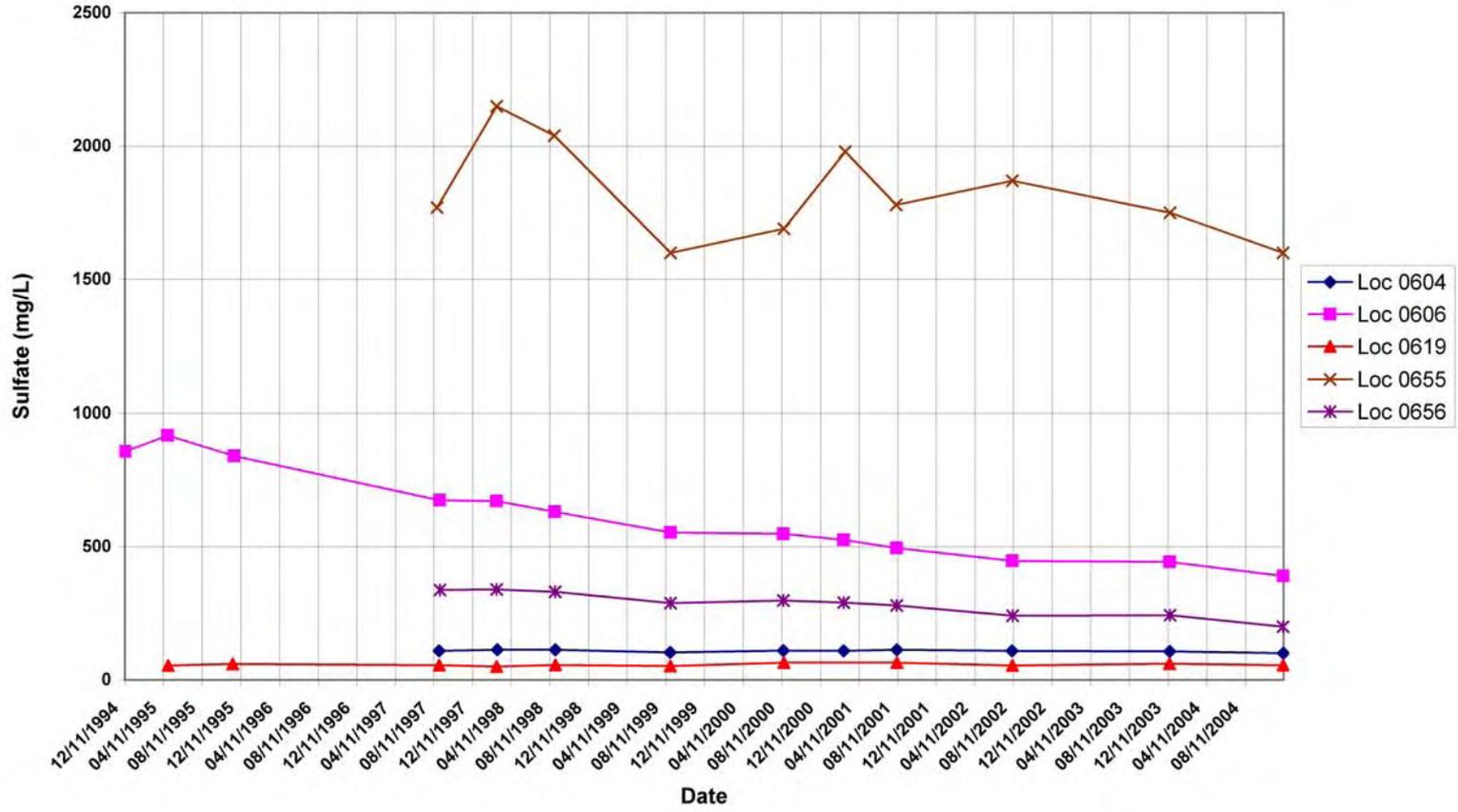
Monument Valley Processing Site (MON01)

Nitrate + Nitrite as Nitrogen Concentration
MCL = 10 mg/L



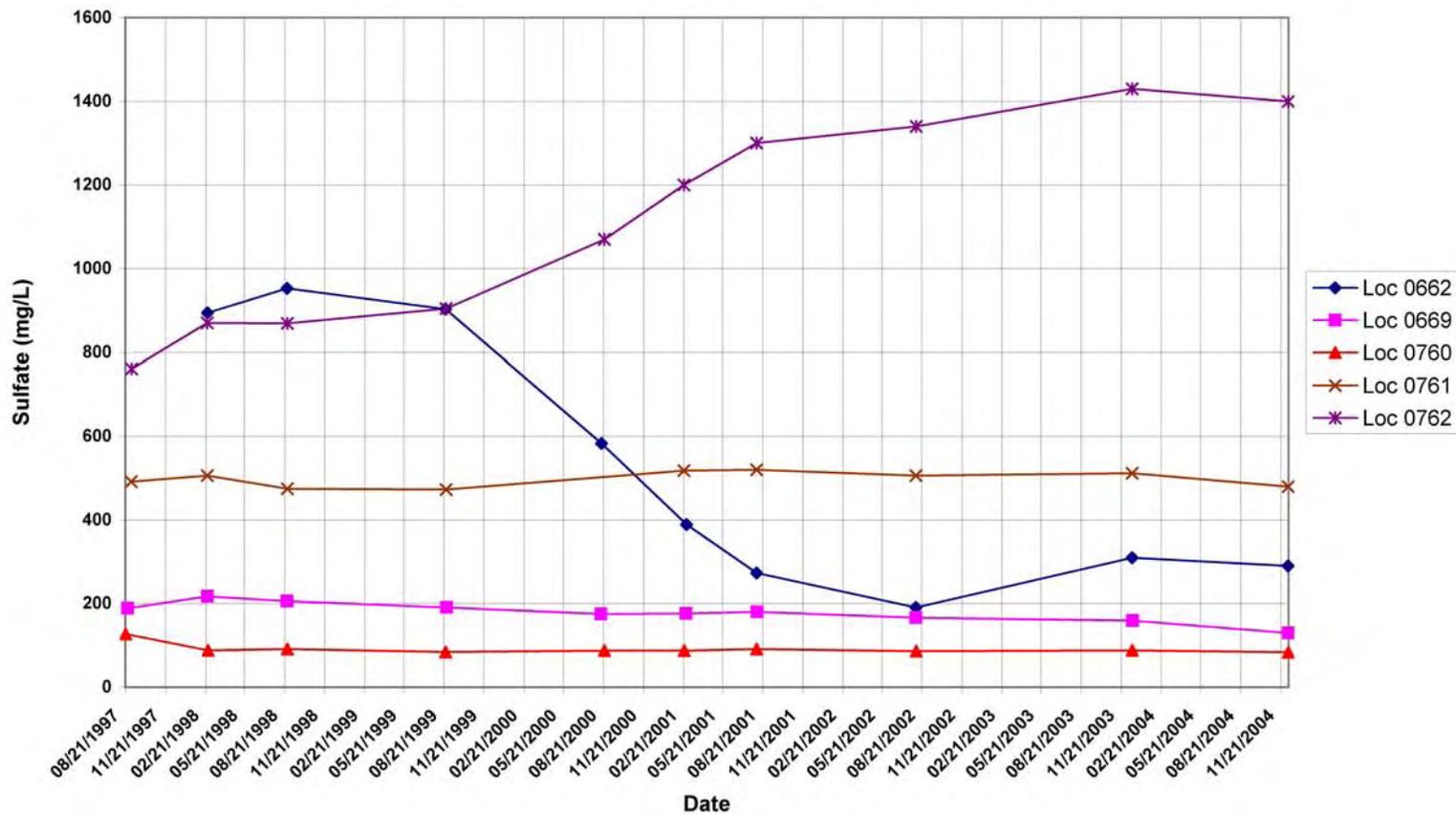
Monument Valley Processing Site (MON01)

Sulfate Concentration



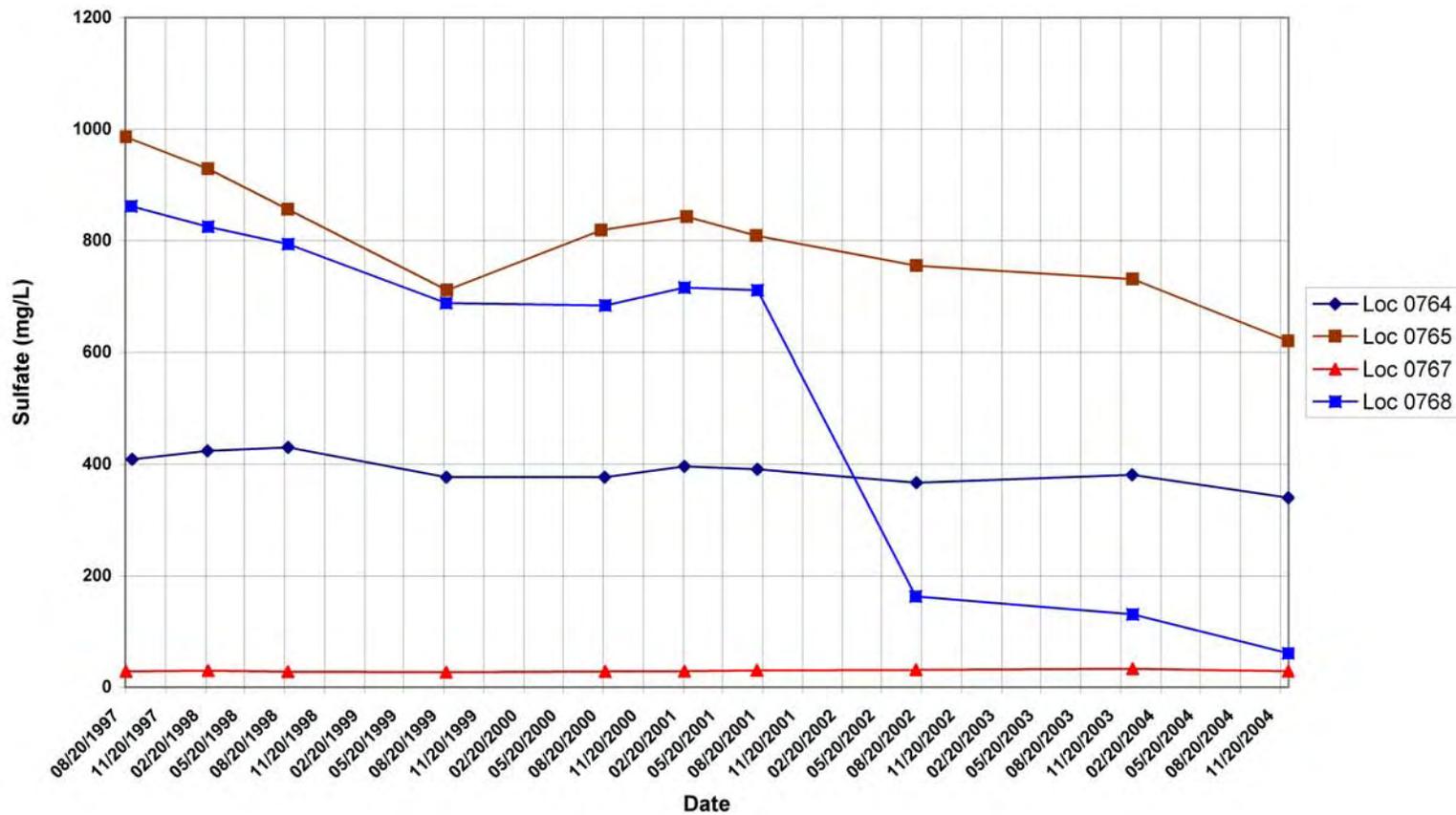
Monument Valley Processing Site (MON01)

Sulfate Concentration



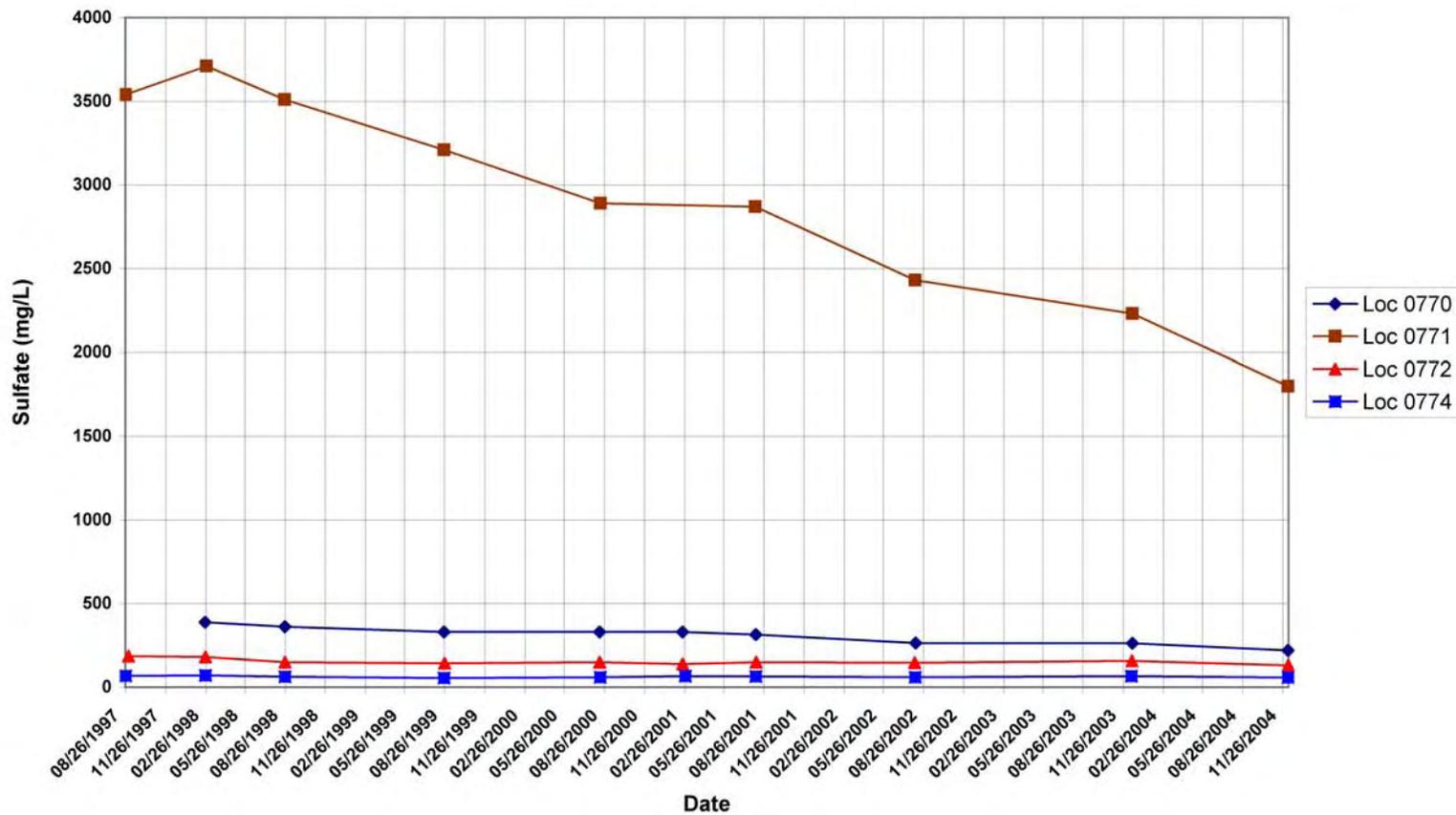
Monument Valley Processing Site (MON01)

Sulfate Concentration



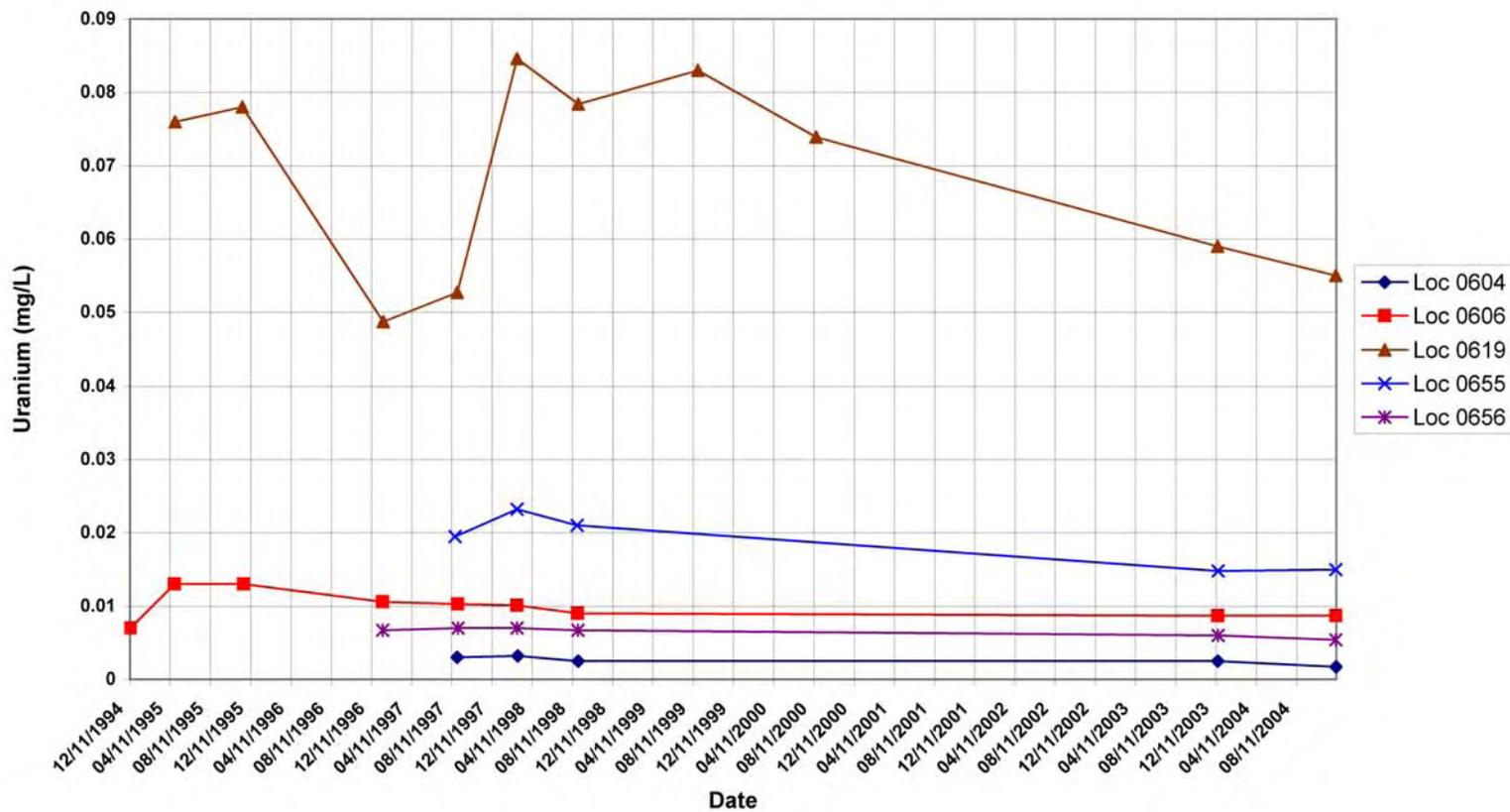
Monument Valley Processing Site (MON01)

Sulfate Concentration



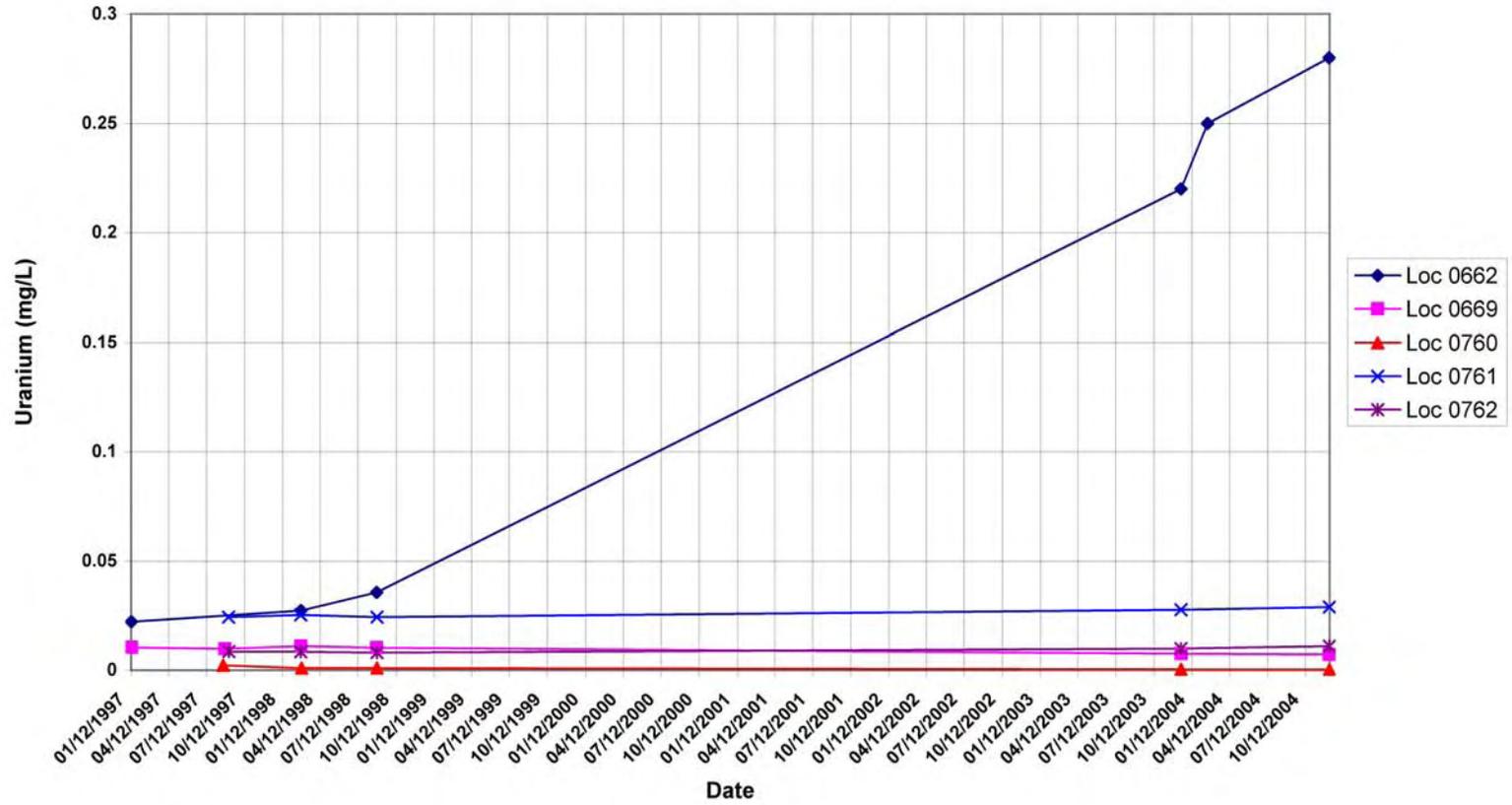
Monument Valley Processing Site (MON01)

Uranium Concentration
MCL = 0.044 mg/L



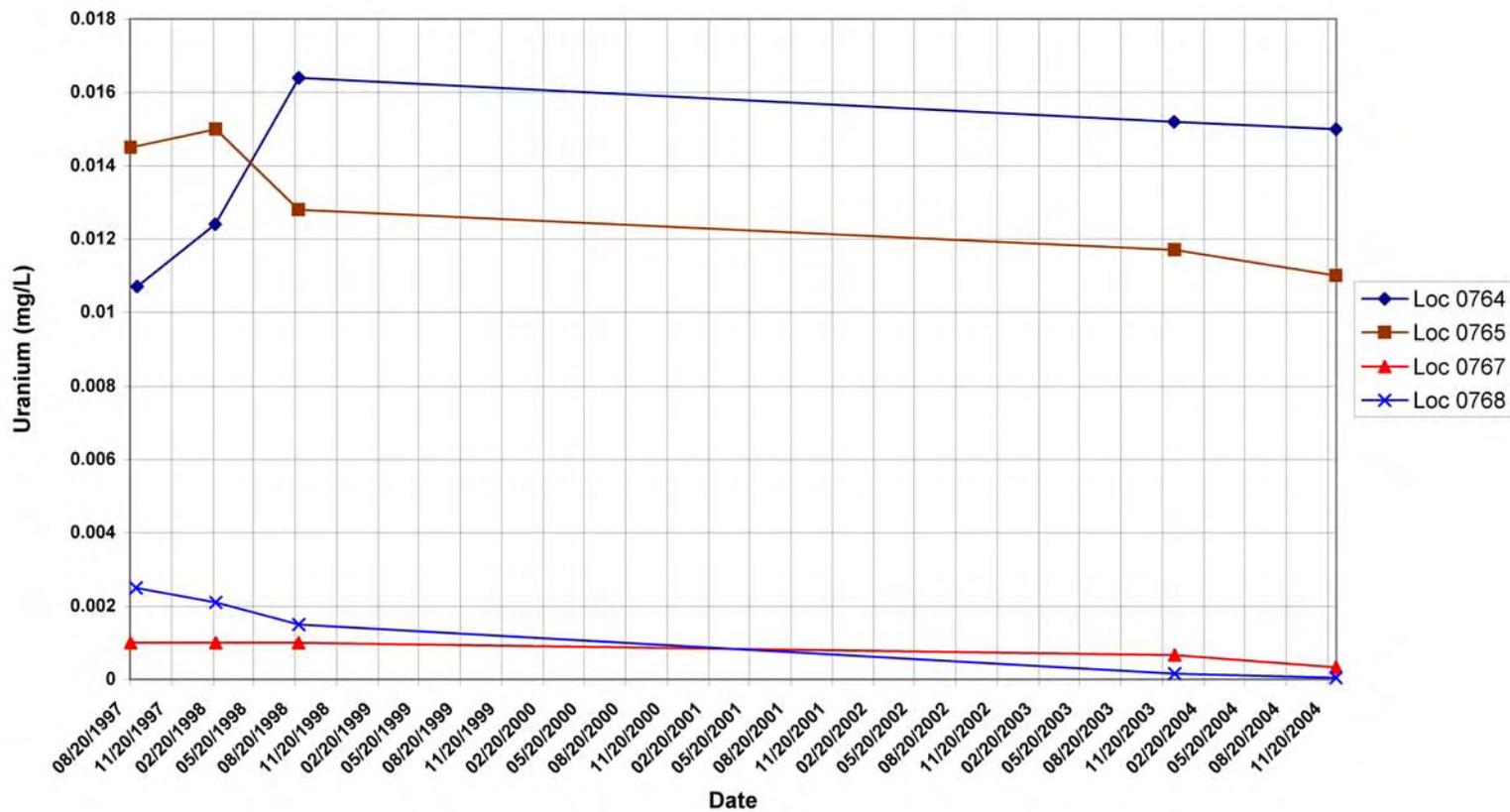
Monument Valley Processing Site (MON01)

Uranium Concentration
MCL = 0.044 mg/L



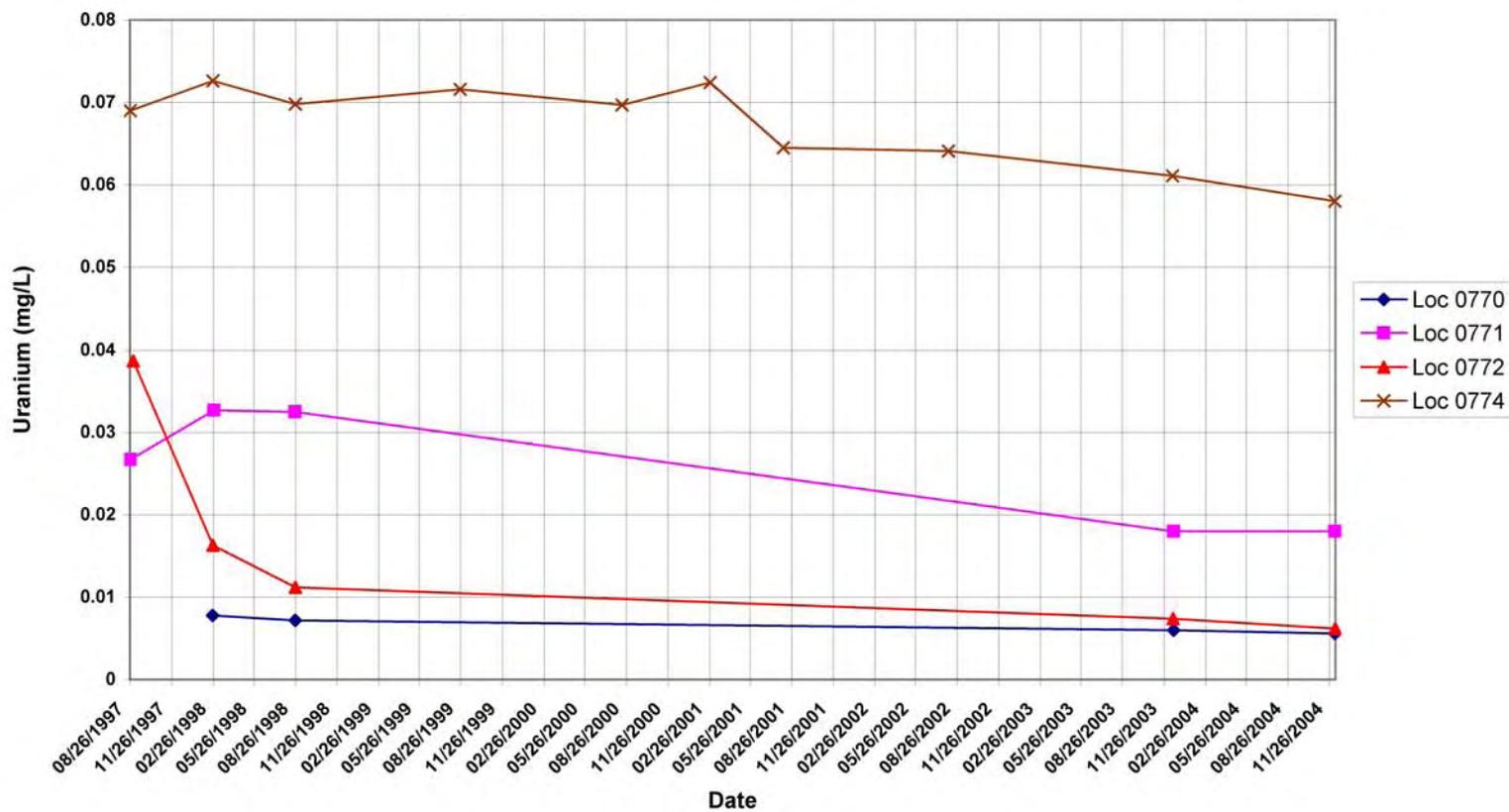
Monument Valley Processing Site (MON01)

Uranium Concentration
MCL = 0.044 mg/L



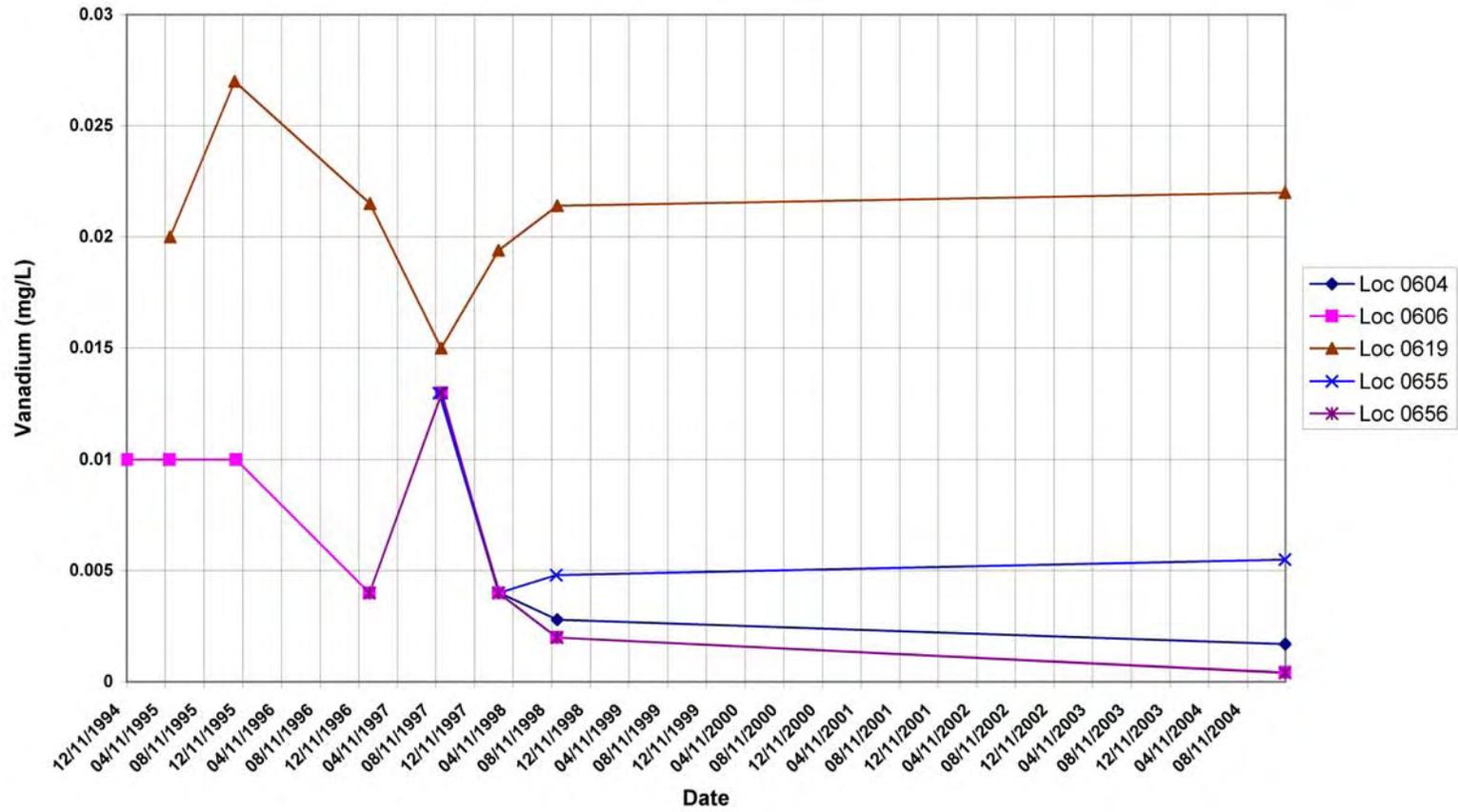
Monument Valley Processing Site (MON01)

Uranium Concentration
MCL = 0.044 mg/L



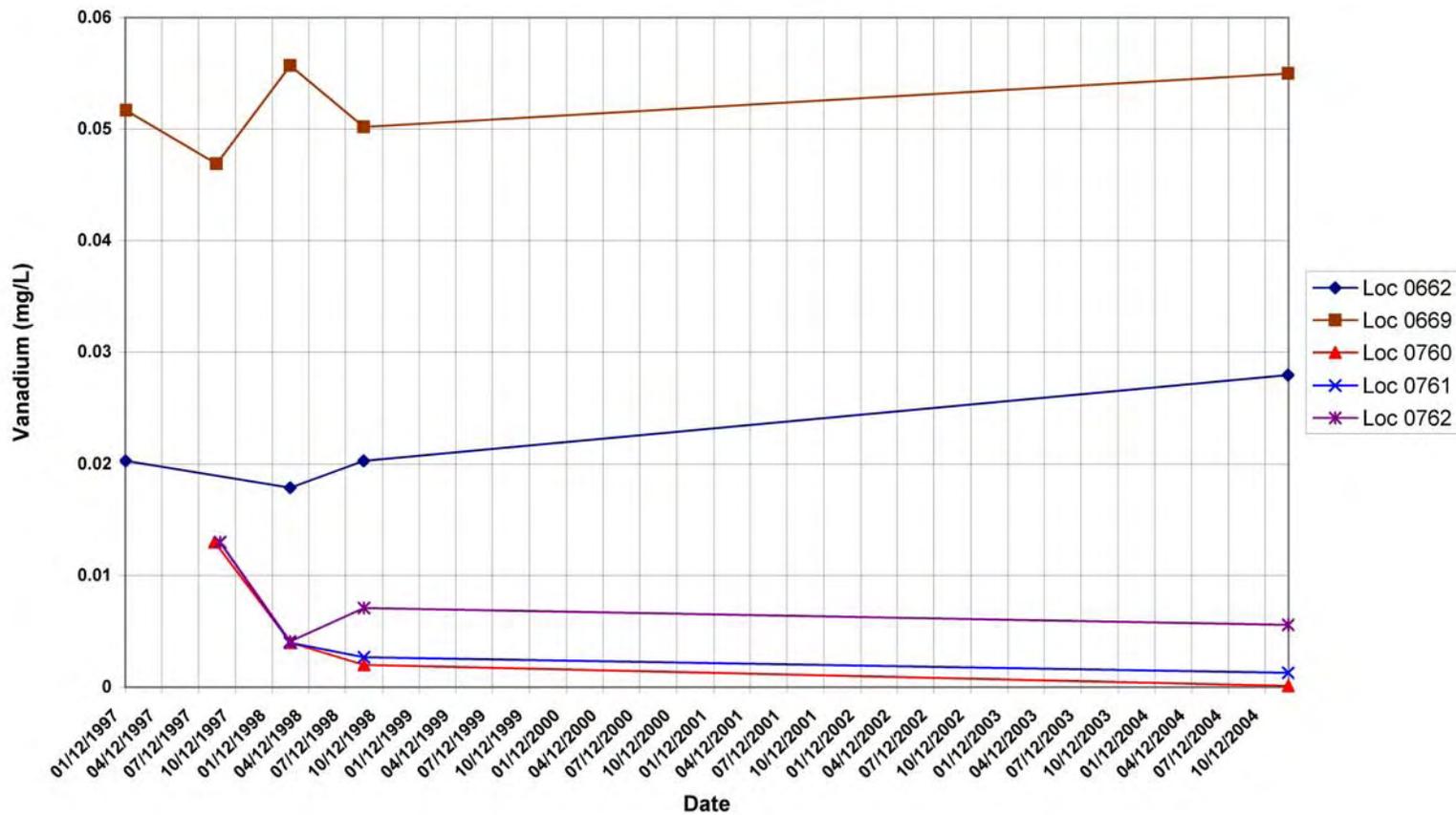
Monument Valley Processing Site (MON01)

Vanadium Concentration



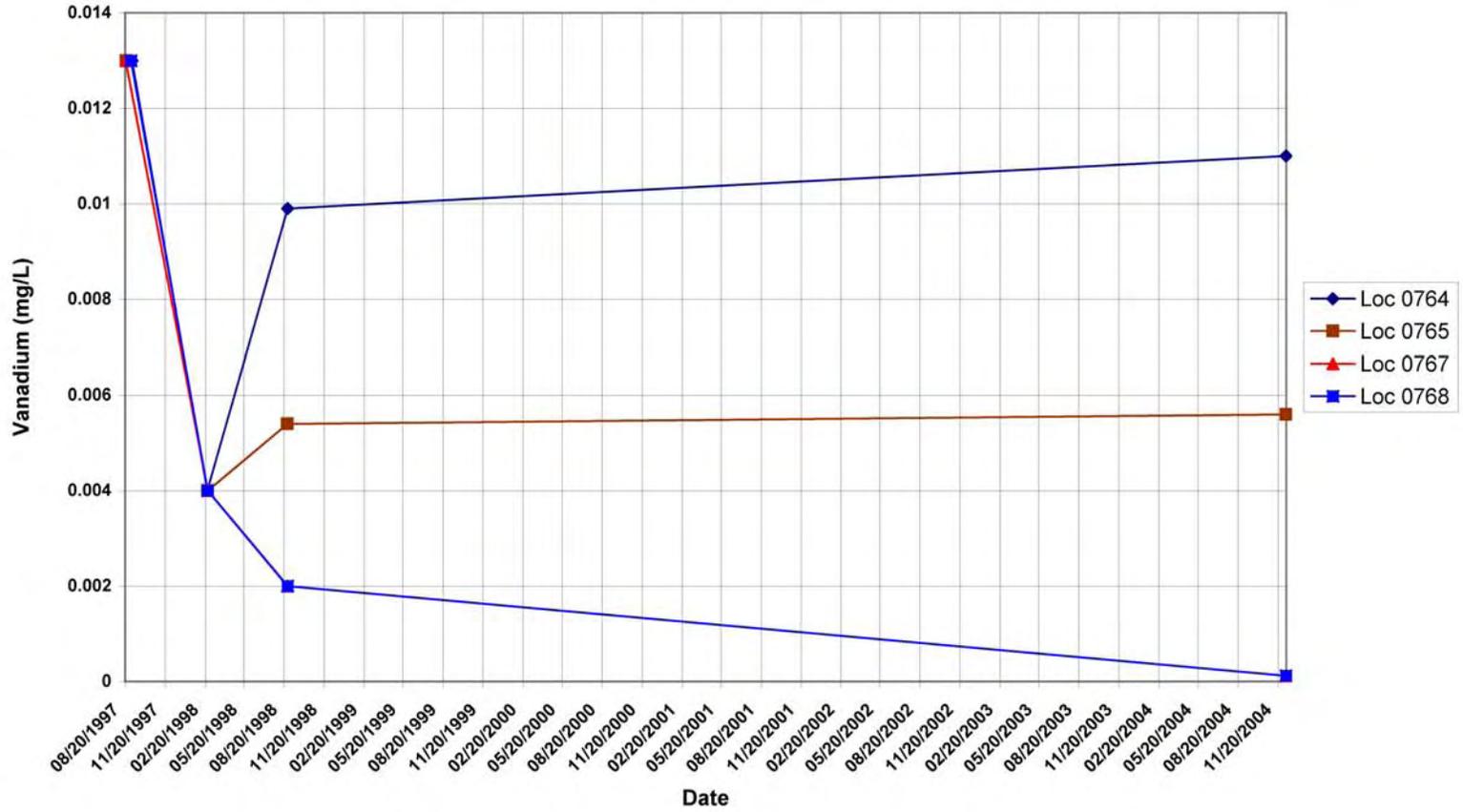
Monument Valley Processing Site (MON01)

Vanadium Concentration



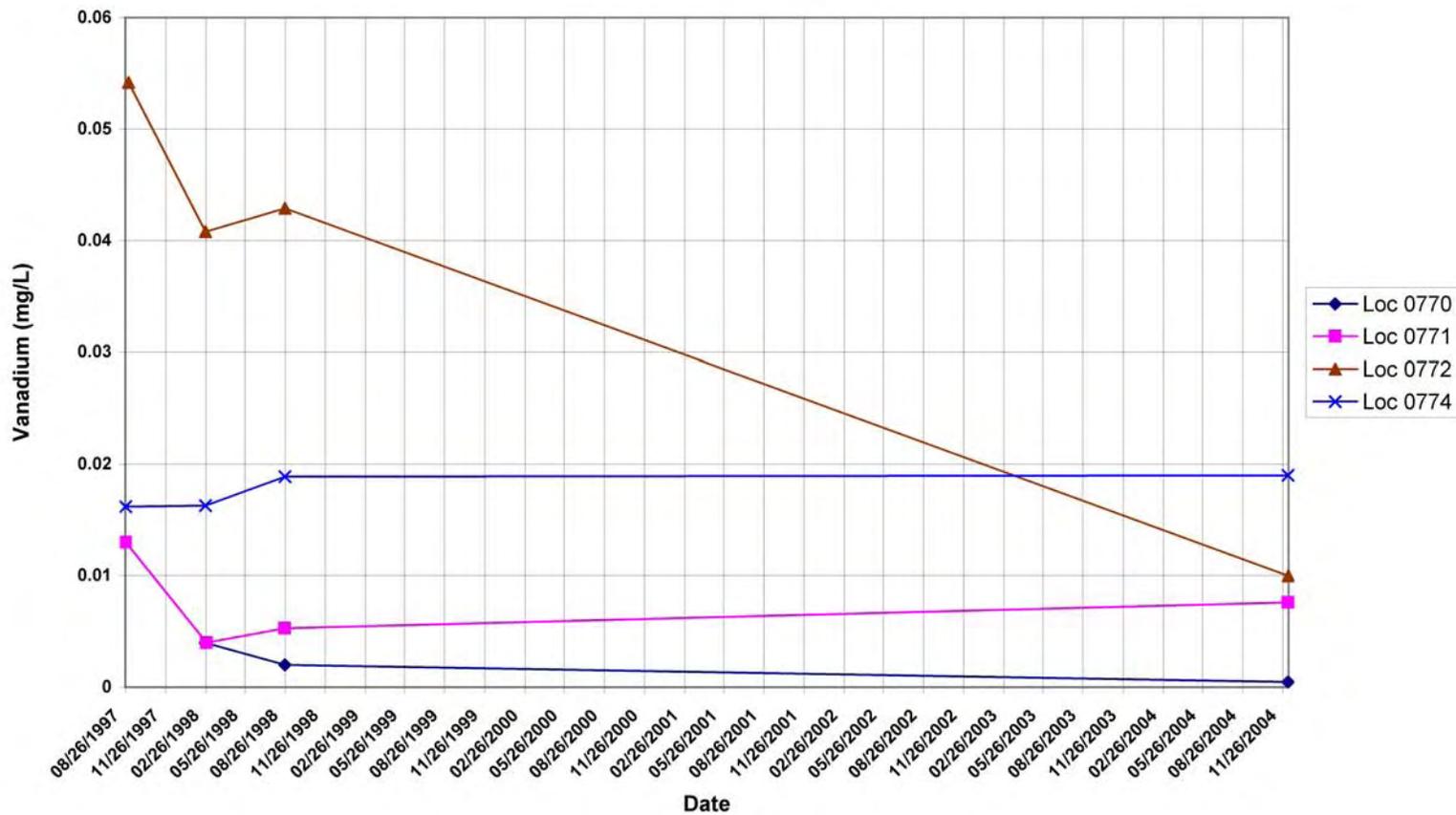
Monument Valley Processing Site (MON01)

Vanadium Concentration



Monument Valley Processing Site (MON01)

Vanadium Concentration



Attachment 3
Sampling and Analysis Work Order



established 1959

Task Order ST05-100
Control Number 1000-T05-0312

November 22, 2004

Arthur Kleinrath
Program Manager
U.S. Department of Energy
Office of Legacy Management
2597 B 3/4 Road
Grand Junction, CO 81503

SUBJECT: Contract No. DE-AC01-02GJ79491, Stoller
December 2004 Environmental Sampling at Monument Valley, Arizona

Reference: FY 2005 LM Task Order No. ST05-100-05-103

Dear Mr. Kleinrath:

The purpose of this letter is to inform you of the upcoming sampling at Monument Valley, Arizona. Enclosed are the map and tables specifying sample locations and analytes for routine monitoring at Monument Valley. Water quality data will be collected from monitor wells and one private well at this site as part of the routine environmental sampling currently scheduled to begin the week of December 6, 2004.

The following lists show the monitor well (with zone of completion) and private well locations scheduled to be sampled during this event.

Monitor Wells (filtered)*

604 Al	655 Al	669 Al	762 Al	767 Al	770 Al	772 Al
606 Al	656 Al	760 Al	764 Al	768 Al	771 Al	774 Al
619 Dc	662 Al	761 Al	765 Al			

*NOTE: Al = Alluvium; Dc = Dechelley Member Of The Cutler Formation.

Private Well (UNfiltered)*

201

QA/QC samples will be collected as directed in the *Sampling and Analysis Plan for GJO Projects*. Access agreements are covered by the cooperative agreement.

If you have any questions, please call me at (970) 248-6588 or David Miller at (970) 248-6652.

Sincerely,

Signature on Original

Clay Carpenter
Project Manager

CC/lcg/lac
Enclosures (3)

cc: S. E. Donovan, Stoller (e)
D. E. Miller, Stoller (e)
K. E. Miller, Stoller
D. G. Traub, Stoller (e)
Working File MON

cc w/o enclosures:
Correspondence Control File (Thru V. Creagar)

\\Condor\projects\LM\ActiveGW\MON\Docs&Data\website\mon000085.doc

Attachment 4
Trip Report

Memorandum

DATE: December 15, 2004

TO: David E. Miller

FROM: Jeffrey E. Price

SUBJECT: Trip Report

Site: Monument Valley, Arizona

Date of Sampling Event: December 7 – 9, 2004

Team Members: Dave Traub and Jeff Price

Number of Locations Sampled: 19 monitor wells were sampled, 1 duplicate sample, and 1 equipment blank also were collected for a total of 21 samples.

Locations Not Sampled/Reason: Well 0201, the water supply well was not sampled as the building and fence were locked. Levon Benally attempted to locate a key but was unsuccessful. He stated that no one was using the well as a drinking water source but instead were using well 0625. Well 0625 was sampled instead of well 0201.

Field Variance: None.

Quality Control Sample Cross Reference: The following are the false identifications assigned to the quality control samples.

TICKET NUMBER	FALSE ID	TRUE ID	SAMPLE TYPE	ASSOCIATED MATRIX
NDY-582	2709	0761	Sample Duplicate	Water
NDY-584	2710	N/A	Equipment Blank	DI Water

RIN Number Assigned: All samples were assigned to RIN 04110138.

Sample Shipment: Samples were shipped FedEx to Paragon Analytics, Inc. from Grand Junction on December 9, 2004 (Air bill No. 801914298460).

Water Level Measurements: Water levels were collected from all sampled wells.

Well Inspection Summary: Well inspections were conducted at all sampled wells; all sampled wells were in good condition. Well 0760 is very near being broken off as the sand has blown

away from under the concrete pad. The well is very loose and is in constant danger from cattle rubbing against the well.

Equipment: All wells were sampled using dedicated bladder pumps or a peristaltic pump using low flow procedures.

Location Specific Information:

Ticket Number	Sample Date	Location	Comments
NDY 580	12/8/2004	0604	Category I
NDU 289	12/8/2004	0606	Category I
NDY 578	12/7/2004	0619	Category I
NDY 586	12/8/2004	0625	Category IV
NDU 281	12/7/2004	0655	Category I
NDU 284	12/7/2004	0656	Category I
NDY 576	12/7/2004	0662	Category I
NDU 286	12/8/2004	0669	Category I
NDU 288	12/8/2004	0760	Category I; could not get stable turbidity. Needs redeveloped; worked pump up and down, purged 12 L after sampling; very fine, reddish silty/sand, slowly settles out.
NDY 581	12/8/2004	0761	Category I
NDY 583	12/8/2004	0762	Category I
NDU 285	12/8/2004	0764	Category II; WL fell below pump.
NDU 287	12/8/2004	0765	Category I
NDY 585	12/8/2004	0767	Category I
NDY 587	12/8/2004	0768	Category I
NDU 283	12/7/2004	0770	Category I
NDU 282	12/7/2004	0771	Category I
NDY 579	12/8/2004	0772	Category I
NDY 577	12/7/2004	0774	Category I
NDY 582	12/8/2004	2709	Category I
NDY 584	12/8/2004	2710	Category I

Regulatory: Levon Benally was at the site on December 8 and observed some of the sampling. He stated the Navajo Nation was not getting enough notice of sampling events. We told him the sampling crews would contact him before sampling at their sites.

Site Issues: None.

Corrective Action Required/Taken: None.

cc: A. W. Kleinrath, LM-50 (e)
S. E. Donivan, Stoller (e)
K. E. Miller, Stoller
Working file MON